

FISHES

BY

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WITH FIVE TEXT-FIGURES AND FOUR PLATES

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INTRODUCTION.

A CHECK-LIST of the fishes of Queensland, Australia, was published by McCulloch and Whitley in 1925 (Mem. Qd. Mus., VIII, p. 125), and in a recent paper (Mem. Qd. Mus. X, 1930, p. 8) I have brought the list as up-to-date as possible. The present contribution to Queensland ichthyology arises from the basis provided by those papers, and by McCulloch's "Check-List" (Mem. Aust. Mus. V, 1929) which should be studied in connection with this Report.

The specimens discussed in the following pages were obtained at Low Isles or Batt Reef, North Queensland, under the auspices of the Great Barrier Reef Expedition, being mostly collected by the author. To various members of the Expedition and to Mr. W. Boardman of the Australian Museum are due thanks for collaboration in making this collection. Over 350 specimens of fishes were secured, and these are here referred to nearly a hundred species. The greater part of this collection will be consigned to the British Museum (Natural History). Details of the synonymy of well-known species have not been tabulated in order to save space, and only specially relevant references to literature have been included. I have tried to lighten the burden of synonymy in the papers quoted above and in my recent papers in the Records of the Australian Museum and the Australian Zoologist.

It is customary, in a report of this kind, to give a list of species, followed by tabulated symbols indicating their geographical or bathymetrical distribution. Whilst this has been attempted, it has not been considered worthy of publication, as the range of the

fishes of the Indo-Australian and Pacific regions is still not sufficiently analysed for such a synthesis to be made. The Low Isles fishes are typically Solanderian forms.* Some of the species mentioned here are newly recorded from Queensland or even Australia, and it is still easy for any Australian collector to add new species to our knowledge from the superabundant fish-fauna of Queensland and other northern Australian waters.

Acknowledgments are gladly tendered to the leader and members of the Great Barrier Reef Expedition for facilities afforded for collecting, observing, and finally reporting on the fishes of Low Isles and vicinity. To my colleague, Mr. William Boardman, who accompanied me to Low Isles as a guest of the Expedition, I am indebted for photographs of various species of fishes in their natural environment and for much help in collecting them. Mr. H. A. Longman, Director of the Queensland Museum, and Mr. J. Shewan, Curator of the Macleay Museum, University of Sydney, kindly lent typical or unique specimens of fishes from the collections in their care for study and comparison with the Low Isles series. The half-tone illustrations for this paper have been kindly prepared by Miss Joyce K. Allan. The black and white drawings are the work of the writer.

HISTORICAL.

Low Isles had apparently been visited by but few collectors prior to 1928.

Huxley and Macgillivray, of the "Rattlesnake," were the first naturalists to land at Low Isles, in 1848. John Macgillivray (Narr. Voy. Rattlesnake, I, 1852, pp. 101-103) remarked: "On July 7th [1848] we anchored to leeward of the Low Isles . . . Many kinds of fishes, *Muraena*, *Diodon*, *Balistes*, *Serranus*, etc., are found in the pools among the coral blocks."

Sir William Macleay in the "Chevert" visited Low Isles, but authors of papers on the Queensland marine fauna have wrongly recorded his specimens from Torres Strait. That the "Chevert" was at the Low Isles off Port Douglas is evident from contemporary accounts which I have consulted in the Mitchell Library, Sydney. Macleay himself wrote in one of these (Sydney Morning Herald, 16th October, 1875, p. 487):

"On the next day [June 6th, 1875] we anchored early off a low wooded sand-bank, marked on the chart "Low Wooded Isle." It was surrounded by an extensive coral reef . . . the whole reef was literally teeming with life—fish in great variety, Crustacea, Echinoderms including several species of beche-de-mer, corals and annelids."

Some fishes were collected by members of the "Chevert" Expedition, and the various species were recorded from Low Isles by Alleyne and Macleay in the early part of the Proceedings of the Linnean Society of New South Wales.

A series of Low Isles fishes was obtained by my late friend, W. E. J. Paradise, in 1923, when he was Surgeon-Lieutenant on H.M.A.S. "Geranium." These specimens are preserved in the Australian Museum and have been recorded in this report.

Non-technical accounts of some of the fishes of the British Great Barrier Reef Expedition have been given by Tandy in Natural History Magazine, II, 1929, by Whitley and Boardman in The Australian Museum Magazine, III, 1929, and by Yonge (A Year on the Great Barrier Reef, published 10th November, 1930).

* Hedley, Proc. Linn. Soc. N.S.W. XXVIII, 1903 (published 28th April, 1904), p. 880.

SYSTEMATIC ACCOUNT.

Family HEMISCYLLIIDAE.

Genus *Hemiscyllium*, Müller and Henle, 1838.

Hemiscyllium ocellatum (Bonnaterre).

This species is very common in shallow waters of the Great Barrier Reef and was one of the first fishes to be described from what is now Queensland. It was occasionally met with under boulders on the reef flat near Madrepore Moat, Low Isles. One specimen preserved; Australian Museum registered number IA.4485. A 3-ft. specimen captured among mangrove (*Rhizophora*) roots had the right ocellus normal, but the left was a mere irregularly defined blackish area.

Family DASYATIDAE.

Genus *Taeniura*, Müller and Henle, 1837.

Taeniura lymnia halgani (Lesson).

Taeniura lymnia halgani, Whitley, Rec. Aust. Mus. XVIII, 25th March, 1931, p. 97, pl. xi (references and synonymy).

The commonest Sting Ray at Low Isles. One specimen caught at Batt Reef had eaten prawns, mantis shrimps and polychaete worms.

Genus *Himantura*, Müller and Henle, 1837.

Himantura granulata (Macleay).

(Plate I, fig. 1).

A specimen seen amongst mangrove roots (28th August). It lay motionless on the mud, and was difficult to distinguish from its shadowy surroundings. Others were seen at different times, showing that this species, which had not at that time been recorded from Australia, was fairly common at Low Isles.

A fine specimen (IA.4477) was caught in a creek amongst mangroves on 19th September, 1928. This agrees well with my account of *Himantura granulata* (Rec. Aust. Mus. XVI, 1928, p. 211, figs. 1, 2), but the ventral surface has series of brownish blotches disposed in roughly symmetrical rows on each side, as well as broad brownish-grey margins. Sex—female; stomach contained small crabs and prawns.

COLOURS WHEN FRESH.—Dark olive-greyish on back, with a few scattered white spots, not forming ocelli or marks like those in Jordan and Seale's figure of *Himantura fai*. Pupil black, enclosed in a whitish ring and surrounded by smoky grey; the eye is outlined with blackish, and has a light grey "eyelid" which does not form a flap.

The eyes protrude laterally. In my figure of a long-preserved specimen they are

represented as sunken in the sockets. The wrinkles around the mouth are probably also largely the result of methods of preservation.

Family STOLEPHORIDAE.

Genus *Stolephorus*, Lacepède, 1803.

Stolephorus robustus (Ogilby).

Three young specimens (IA.4470), tow-netted at night, September, 1928, are apparently referable to this species.

Family CLUPEIDAE.

Genus *Harengula*, Cuvier and Valenciennes, 1847.

Harengula punctata (Rüppell).

One (IA.4459) in the Australian Museum from Low Isles, 30th September, 1928, compared with three (I.4581) in the Queensland Museum from the same locality.

Clupea profundis, *C. ranelayi* and *C. torresiensis*, Saville-Kent, may be relegated to the synonymy of this species. All these are *nomina nuda* taken from the manuscripts of De Vis; they were also listed in Saville-Kent's *The Great Barrier Reef of Australia*, p. 370.

The type of *C. ranelayi* is 31 mm. long, and is preserved in the Queensland Museum. Specimens labelled *C. torresiensis* are in the Queensland and Australian Museums. The type of *C. profunda* (*sic*) is in the Australian Museum.

Family OPHICHTHIIDAE.

Genus *Zonophichthus*, Whitley, 1930.

Zonophichthus marginatus (Bleeker).

One (IA.4491) from Low Isles agrees with Bleeker's figure of *Ophichthys cephalozona*; I have not seen Bleeker's original description of *Muraenopsis marginatus*, but do not regard it as invalidated by *Ophisurus marginatus* Peters, as the two species are evidently not congeneric.

LIFE COLOURS.—General colour greyish brown, darkest dorsally; dirty white ventrally. A whitish band across the nape is followed by a prominent, broad, saddle-shaped band of very dark brown, and this is bordered posteriorly by another whitish band which encircles the fish at the pectorals and a little before the dorsal. Pupil black, rest of eye olivaceous. The rims of the mucus-pores on the head and body are brown. Dorsal greyish near base, becoming darker inframarginally, but bordered by strongly contrasted white. Anal similar to dorsal. End of tail fading to whitish with the extreme tip pink.

Vent and genital aperture brownish. Pectoral yellow, with a white border, darker on its inner surface.

Occasionally seen swimming in shallow water over coral in reef flat.

Family MURAENIDAE.

Genus *Echidna*. Forster, 1788.

Echidna nebulosa (Thunberg).

One (IA.4087) from Low Isles under stone. 15th September; two (IA.4088) from Snapper Island and one old specimen (IA.4058) from Batt Reef. Deraniyagala has erroneously included "South Australia" in the range of this common tropical species, but it is doubtful whether it crosses the border of Queensland and New South Wales. An ancient figure, which seems to represent this species, has been given by Valentyn (Amboina. III, 1726, p. 460, fig. 364).

Genus *Gymnothorax*, Bloch, 1795.

Gymnothorax cancellatus (Richardson).

Muraena cancellata, Richardson, Zool. Voy. "Erebus" and "Terror," Fish, 1848, p. 87, pl. xlv, figs. 1-5.

West Australia (type-loc.); Cape Upstart, Queensland; and Sumatra. Types in British Museum.

Thyrsoidea cancellata, Kaup, Cat. Apodal Fish Brit. Mus. 1856, p. 76, fig. 59 (type).

Gymnothorax cancellatus, Bleeker, Atlas Ichth. IV, 1864, p. 93, pl. clxxv, fig. 3 (East Indies).

Muraena cancellata, Macleay, Proc. Linn. Soc. N.S.W. VIII, 1883, p. 278 (Hood Bay, New Guinea).

One specimen from Low Isles (IA.4056).

Weber and Beaufort regard this form as identical with *Gymnothorax undulatus* (Lacepède), but, as my specimen agrees better with the figures of Richardson and Bleeker, I am using the name *cancellatus* for it. The colours of the Western Australian typical form are more diffuse than in the Queensland specimen, but it seems inadvisable to give a new name to the latter. Fowler (Mem. Bishop Mus. X, 1928, pp. 56, 57) has given a long list of nominal synonyms of *Lycodontis* (= *Gymnothorax*) *undulata* (Lacepède).

Gymnothorax melanospilos (Bleeker).

One specimen (IA.4052) from Low Isles, whose head has been figured in the Aust. Mus. Mag. iv, 1930, p. 98.

LIFE COLOURS.—Ground-colour light greenish grey on back, sides, and dorsal fin; lighter and suffused with pinkish below. Top of head dark greenish; chin brown. A number of irregular dark brown spots on head, body, and dorsal fin. Anal whitish. Eye blue, with a coppery ring; iris greyish. Grooves on throat brown. Jaws white; rictus dark brown. Inner parts of mouth brown.

Genus *Anarchias*, Jordan and Seale, 1906.

Anarchias, Jordan and Seale, Bull. U.S. Bur. Fish XXV, 1905 (1906), p. 204.

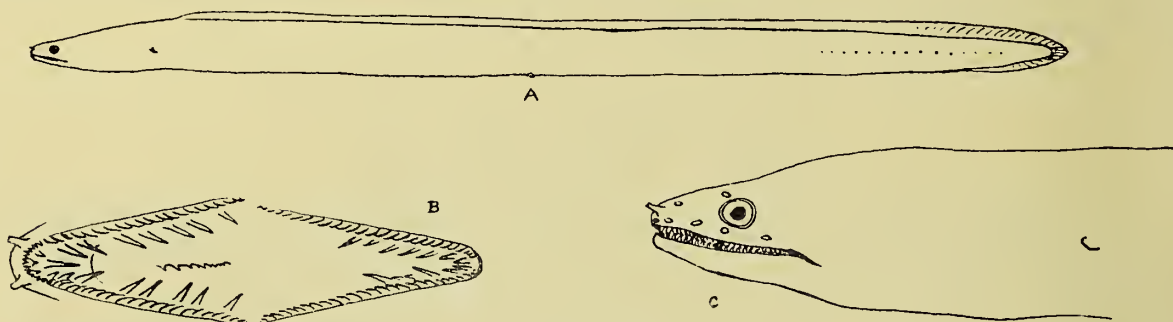
This genus, whose name must not be confused with the variants of *Anarhichas*,

Linnaeus, is distinguished from *Gymnothorax* by having the anal fin atrophied anteriorly. It has not before been recognized from Australia, having been recorded only from Samoa and the Philippine Islands. There is, however, a New Hebrides specimen of *A. knighti*, Jordan and Seale, in the Australian Museum, so that the range of the genus is now considerably extended.

Anarchias insuetus, sp. n.

Head (21.5 mm.) 8.6, depth (9) about 20 in total length (185). Interorbital subequal to eye (2), 1.5 in snout (3). Gape (8) 2.7 in head. Head and body (90) shorter than tail (95).

Profile of head oblique. Snout rounded. Upper jaw slightly longer than lower. Eye small, round, enveloped in skin. Anterior nostrils in the form of short tapering tubes. Posterior nostrils circular, without an elevated rim.



TEXT-FIG. 1.—*Anarchias insuetus*, sp. n. Holotype from Low Isles. Regd. no. IA.4458.

A. The entire specimen. B. Dentition (enlarged). C. Head (enlarged). Drawings by Gilbert P. Whitley.

Four large subelliptical pores along the margin of the upper jaw. Two similar pores on the interorbital, one over the anterior half of each eye. Gill openings small, lateral, rising obliquely upward and forward.

Gape large, extending almost as much behind the eye as it does before it. All the teeth are more or less movable. A single series of small hinged inter-maxillary teeth with a small mesial tooth and a large depressible fang on the intermaxillary plate. An outer row of short, curved, pointed teeth in a single series on each maxillary, flanked by an inner row of about seven long, depressible fangs. A single series of about seven depressible teeth on the vomer, which forms a ridge. Mandible with an outer row of close-set, curved teeth and a group of fang-like teeth behind the symphysis. Several depressible fangs, on each side of the mandible, inside the outer row of smaller teeth. These were probably originally symmetrical, but some small recumbent teeth in the present example suggest that replacement of broken ones is taking place.

General form of body elongate, rather compressed. The trunk is three times the length of the head, and the tail is longer than the head and trunk combined. Integument smooth, tough. Lateral line with small, spaced pores. Dorsal fin originating a short distance behind head and continuing as a low, fleshy fold to the tip of the tail, where it is indistinguishable externally from the minute caudal fin. Anal fin atrophied anteriorly, appearing as a low fold posteriorly, where it joins the caudal in a similar manner to the

posterior portion of the dorsal fin. Weak fin-rays can only be discerned around the tip of the tail.

General colour, in alcohol, dark olive brown, becoming tinged in places with yellowish, especially on the lower part of the head and body, and becoming still lighter on the lips. Dorsal, caudal, and anal blackish. No spots. No black mark around gill-openings.

Described and figured from the holotype, a somewhat shrivelled specimen, 185 mm. long, from Low Isles, off Port Douglas, Queensland.

Australian Museum registered number IA.4458.

This new species appears to differ from its congeners in the shape of the head, the disposition of its teeth, and in having a fairly uniform coloration.

Genus *Siderea*, Kaup, 1856.

Siderea picta (Thunberg).

One large specimen (IA.4489) from the reef flat at Low Isles agrees with Weber and Beaufort's fig. 183c (Fish. Indo-Austral. Arch. III, 1916). This species was commonly seen swimming over coral; it generally leaned to one side and kept the mouth wide open, and is probably the kind of which MacGillivray (Narr. Voy. Rattlesnake, I, 1852, p. 102) had such unpleasant experience.

Genus *Uropterygius*, Rüppell, 1838.

Uropterygius marmoratus (Lacepède)

One (IA.4490) from Low Isles; wriggling, head or tail first, amongst coral debris. A common Indo-Pacific species not hitherto noticed from Queensland.

LIFE COLOURS.—Ground-colour creamy white, almost covered by light and dark brown blotches which are more densely crowded near the dorsal surface. Dorsal and anal fins imperceptible, even the tip of the tail being fleshy. Vent dark bluish. Pupil black, surrounded by a coppery ring; iris light violet.

Family FISTULARIIDAE.

Genus *Fistularia*, Linnaeus, 1758.

Fistularia petimba, Lacepède.

A specimen seen early one morning inshore changed colour, when disturbed by a nearby school of fishes, from uniform cigar-brown to sandy-coloured bars alternating with dark brown bands irregularly broken by lighter.

I have examined a specimen from Low Isles in the Queensland Museum, Brisbane.

Family SYNGNATHIDAE.

Genus *Hippichthys*, Bleeker, 1849.

Hippichthys, Bleeker, Verh. Batavia Genoot. XXII, 1849 (Ichth. Faun. Madura), p. 15. Genotype, *H. heptagonus*, Blkr.

? *Corythoichthys*, Kaup, Archiv Naturgesch. (Wiegmann), XIX, 1, 1853, p. 231; Cat. Lophobr. Fish Brit. Mus. 1856, p. 25. Genotype, *C. albirostris*, Kaup, selected by Jordan and Evermann, Rept. U.S.

Comm. Fish 1895 (28th December, 1896), appendix 5, p. 328, where the name is spelt *Corythoichthys*.

Corythoichthys, Duncker, In Michaelsen and Hartmeyer, Faun. S.W. Austr. Bd. II, lief. 15, 1909 p. 237; Jahrb. Hamburg Wiss. Anst. XXIX, 1912, p. 232. *Non sensu stricto*. Genotype regarded by Duncker as *Syngnathus conspicillatus* Jenyns.

In diagnosing *Hippichthys*, Bleeker remarked that it had no anal fin. This fin is minute and sometimes difficult to see in species of the genus called *Corythoichthys* by writers on Indo-Pacific Syngnathidae, and as, apart from this discrepancy, Bleeker's description applies to the Pipe-fishes described below, his generic name may be employed.

Subgenus *Bhanotichthys*, Parr, 1930.

Bhanotichthys, Parr, Bull. Bingham Oceanogr. Coll. III, 1930. Genotype, *Syngnathus fasciatus*, Gray.

Hippichthys (*Bhanotichthys*) *intestinalis* (Ramsay).

Syngnat(h)us intestinalis, Ramsay, Proc. Linn. Soc. N.S.W. V, 20th May 1881, p. 494. No locality (= Duke of York Island and Bougainville I., Solomons). Types in Austr. Mus., Sydney, examined; Boulenger, Cambr. Nat. Hist. 1904, p. 635.

Corythoichthys waitei, McCulloch, Abstr. Proc. Linn. Soc. N.S.W., No. 285, July, 1910 (Cairns Reef, off Cooktown, Queensland).

Corythoichthys intestinalis, McCulloch, Zool. Res. "Endeavour," I, 1911, p. 26; Ogilby, Mem. Qd. Mus. II, 1913, p. 90.

? *Corythoichthys fasciatus*, Duncker and Mohr, Mitt. Zool. Mus. Hamburg, XLI, 1925, p. 108 (New Guinea, New Mecklenburg, New Pomerania). Not *Syngnathus fasciatus*, Gray, Illust. Indian Zool. I, October, 1830, pl. lxxxix, preoccupied by *S. fasciatus*, Risso, Ichthyol. Nice, 1810, p. 70.

Corythoichthys flavofasciatus, Fowler, Mem. Bishop Mus. X, 1928, p. 113 (Pacific localities); McCulloch, Mem. Aust. Mus. V, 1929, p. 87. Not *Syngnathus flavofasciatus*, Rüppell, Neue Wirbelth. Abyssin. Fische, 1838, p. 144.

D. 28; A. 2; P. 16; C. 8. Osseous rings 16 + 33.

Head (14.5 mm.) 9.3 in total length (134). Depth (5) 6.4 in trunk (32), which is 2.4 in tail including caudal (76). Length of caudal (4) 3 in base of dorsal (12). Length of pectoral (3) equals longitudinal diameter of orbit (3), 2 in snout (6), which is a trifle longer than posterior portion of head (5.5).

Body elongate, seven-cornered in transverse section, deepest before the dorsal. Tail tapering, four-cornered in cross-section. Dorso-lateral ridges of body and tail not continuous. Lateral ridges of body ceasing on the ring before that on which the dorso-lateral ridges of the tail commence.

Ventro-lateral ridges of body and tail continuous. A weak median keel on body ventrally. Brood pouch on anterior ten tail-rings, but ventral flaps extend still farther back.

Mouth small; snout keeled above. Eyes large, with concave interorbital. A transverse keel on the operculum, which is also pitted. A pair of crests above and behind eyes; three median crests on nape. No serrations on crests.

Dorsal originating behind vertical of anus, its base not raised. Anal fin minute. Caudal with thick pointed rays.

Straw-coloured, suffused with pinkish, crossed by about seventeen patches of blackish reticulations which break into pairs posteriorly. A few blackish reticulations on head, back, and flaps of brood pouch; none on ventral surface. A short brown stripe below opercular ridge, a darker one extending along posterior half of snout, below eye, to lower

part of operculum. Several small dark brown blotches on isthmus and three larger ones on ventral surface of first three body-rings.

Described from one of three specimens. $4\frac{3}{4}$ to 5 in. long, collected at Batt Reef, Queensland. 13th September, 1928: where the species was commonly seen lying on the sand, but would wriggle into weed or under stones when disturbed. Registered Nos. IA.4059 (described specimen) and 4060 (2 specs.). Another (IA.4469) from coral in moat at Low Isles.

This species is listed from Australia as *Corythoichthys flavofasciatus*, Rüppell (McCulloch, Mem. Aust. Mus. V. 1929, p. 87), but as that is a Red Sea species, it seems doubtful whether the Australian form is conspecific. I have compared Queensland specimens with the types of *Syngnathus intestinalis*, Ramsay, in the Australian Museum, and find they agree excellently.

Corythoichthys sealei, Jordan and Seale (Seale, Occ. Pap. Bishop Mus. IV, 1, 1906, p. 17 *nom. nud.*; Jordan and Seale, Bull. U.S. Bur. Fish. XXV, 1906, p. 213, fig. 18, Apia, Samoa), has two broad blackish bands on each side of head and blotches on body not nearly so densely reticulated. Specimens of this species were collected for the Australian Museum at Pango Pango, Samoa, by Charles Hedley. *Corythoichthys waitei* of the same authors has apparently different formula and denser colour-markings.

Duncker (Jahrb. Hamburg. Wiss. Aust. XXXII, 1915, p. 72) and Weber and Beaufort (Fish. Indo-Austr. Archip. IV, 1922, p. 70, fig. 31) unite these forms with the Indian *C. fasciatus* (Gray) (a preoccupied name), whilst noting that the Pacific form has a shorter and more slender snout.

Günther (J. Mus. Godeffroy, VI. 17 [Fische Südsee, IX], 1910, p. 431, pl. clxvii, fig. c) records "*Syngnathus haematopterus*" from New South Wales, but I very much doubt whether its range extends so far southward. Probably Günther thought Ramsay's unlocalized specimen came from this State. His figure shows a fish in which the dark transverse bands are fasciated rather than reticulated as in *Hippichthys intestinalis*.

Specimens of *Hippichthys intestinalis*, 2 to $6\frac{1}{2}$ in. long, are in the Australian Museum from Cairns Reef off Cooktown, Queensland; North Coast of Guadalcanar, and Bougainville I., Solomon Islands; New Britain; Fiji; Vila and Malekula, New Hebrides; Duke of York Island (from intestine of bêche-de-mer)—types of *Syngnathus intestinalis*, Ramsay.

Genus *Doryrhamphus*, Kaup, 1853.

Doryrhamphus melanopleura (Bleeker).

One (IA.2373) collected at Low Isles by Dr. W. E. J. Paradice.

Family BELONIDAE.

Genus *Strongylura*, Van Hasselt, 1823.

Strongylura terebra (Whitley).

Two specimens (IA.4090-1) from Low Isles, netted by lamplight at night, 8th September, 1928.

Tylosurus sp.

Large specimens, tentatively regarded as *Tylosurus*, were seen leaping from the water between Low Isles and Batt Reef but no specimens were secured.

Family HEMIRAMPHIDAE.

Genus *Farhians*, Whitley, 1930.*Farhians commersonii* (Cuvier).

- Esox marginatus* var. b. *far*, Forskål, Descr. Anim. 1775, pp. xiii and 67, species 98, var. b. Vernacular name in a non-binomial work. Loheia, Red Sea.
- Esox gladius* var., Lacepède, Hist. Nat. Poiss. V, 1803, pp. 295 and 313, pl. vii, fig. 3. "Indies" (=East Indies). Type of *Hemiramphus commersonii*, Cuvier.
- Hemiramphus commersonii*, Cuvier, Règne Anim. ed. 2, II, April, 1829, p. 286, footnote 1. Based on Lacepède's figure (type locality, East Indies, designated by Whitley, Aust. Zool. VI, 1930, p. 250); Valenciennes, C. R. Acad. Sci. Paris, XXIII, August, 1846, p. 269; Cuvier and Valenciennes, Hist. Nat. Poiss. XIX, "1846" (= May, 1847), p. 28; ed. 2, p. 20; Alleyne and Macleay, Proc. Linn. Soc. N.S.W. I, 1877, p. 349 (Cape York, Queensland).
- Hemiramphus far*, Rüppell, Neuc Wirbelth. Abyssin., Fische, 1837, p. 74 (Red Sea).
- Hemiramphus moar*, Thiollière, Ann. Agric. Soc. Lyon, VIII, 1856; Essai Faune Île Woodlark (Montrouzier), 1857, p. 205. Woodlark Island. Virtually a *nomen nudum*, regarded as equivalent to *H. far* by Fowler, Mem. Bishop Mus. X, 1928, p. 77.
- Hemiramphus obesus*, Castelnau, Mém. Poiss. Afr. Aust. 1861, p. 64. Port Natal, South Africa (*vide* Barnard, Ann. S. Afr. Mus. XXI, 1925, p. 262.)
- Hemiramphus far*, Bleeker, Atlas Ichth. VI, 1871, p. 54, pl. cclii, fig. 3, as *H. commersonii*, published 1869; Saville-Kent, Gt. Barrier Reef, 1893, pp. 299 and 370, pl. xlvii, fig. 2 (Queensland); Stead, Edible Fish, N.S. Wales, 1908, p. 37; Cockerell, Mem. Qd. Mus. II, 1913, p. 51 (scales); Boulenger, Cat. Freshw. Fish, Afr. III, 1915, p. 15, fig. 9; Weber and Beaufort, Fish. Indo-Austr. Archip. IV, 1922, p. 156, fig. 55 (references).
- Farhians commersonii*, Whitley, Aust. Zool. VI, 1931, p. 314 (N.S. Wales).

Three specimens caught offshore at Low Isles by Mr. F. S. Russell, using a trout fly, on 23rd August, 1928. One of these (IA.4480) is preserved in the Australian Museum, together with a specimen from the same locality (IA.1676) collected by Dr. Paradise.

LIFE COLOURS.—Back dark greenish-blue, each scale with a greyish border and some scales entirely grey. Sides of body brilliant silver with blue and green iridescence in some lights. Lateral band silvery white, margined above by a less definite blue band. Lower parts of body silvery white. Top of head greenish with peacock-blue reflections. Opercles and sides of head silvery with pink iridescence. Top of lower jaw brownish grey; its ventral surface orange, brighter towards tip, and the flaps orange margined with black. Pupil black, iris white; upper part of eye peacock green. Dorsal brilliant bluish green anteriorly, yellow tipped, and white posteriorly. Upper caudal lobe greenish with yellow tip; lower lobe blue. Pectorals, ventrals, and anal white. Axillary spot dark blue.

TAXONOMY.—I have been unable to trace in literature any acceptable usage, in true binomial fashion as a scientific name, of Forskål's Arabic vernacular name *Far*, before Rüppell employed it as a specific name in 1837. Bonnaterre (Tabl. Encycl. Meth., Ichth., 1788, p. 175) and Bory de Saint Vincent (Dict. Class. d'Hist. Nat. VI, 1824, p. 311) merely used *Far* in the vernacular, and Forskål's variety was not distinguished from *Esox marginatus* in either Gmelin's (1789) or Turton's (1806) editions of the Systema Naturae of

Linnaeus. *Hemiramphus commersonii*. Cuvier, is said to be conspecific with *H. far*, Rüppell, and as Cuvier's name has priority it must be used for this species.

I have designated "East Indies" as the type-locality of *H. commersonii*. If the Red Sea form be distinct, it should be known as *Farhians far* (Rüppell).

Genus *Zenarchopterus*, Gill, 1863.

Zenarchopterus dispar (Cuv. and Val).

D.11, its fourth ray produced into a hook. A.11, the sixth ray feather-like and nearly reaching end of caudal, and the seventh ray feather-like to a much less degree. P.10. Anal papilla mammiform. Upper jaw as long as broad.

A male (IA.4467), characterized above, and two females (IA.4468) from amongst mangroves, Low Isles, where the species was commonly seen swimming about the mangrove roots or floating at the surface of the clear water. These fishes are difficult to catch, but I secured my specimens by throwing sand at them and stunning them.

A larva (IA.4474) is apparently also referable to this species; it was found swimming amongst young mullet in the moat near the mangrove park.

Genus *Arrhamphus*, Günther, 1866.

Arrhamphus sclerolepis, Günther.

One (IA.4501) from Low Isles. 2nd September, 1928.

Family ATHERINIDAE.

Genus *Pranesus*, Whitley, 1930.

Pranesus ogilbyi, Whitley.

Atherina lacunosa, Alleyne and Macleay, Proc. Linn. Soc. N.S.W. I, 1877, p. 340 (Cape York?). Not

Atherina lacunosa, Bloch and Schneider, Syst. Ichth. 1801, p. 112.

Atherina pinguis, Alleyne and Macleay, Proc. Linn. Soc. N.S.W. I, 1877, p. 340 (Hall Sound, New Guinea).

Not *Atherina pinguis*, Lacepède, Hist. Nat. Poiss. V, 1803, p. 372, pl. xi, fig. 1; Saville-Kent, Gt. Barrier Reef, 1893, pp. 293 and 370; Tosh, Parl. Rept. Mar. Dept. Qd. 1902-3 (1903), p. 22, pl. xxii, fig. 8 (egg); Ogilby, Mem. Qd. Mus. I, 1912, pp. 37-38, pl. xii, fig. 1, and text-fig. a; Cockerell, Mem. Qd. Mus. II, 1913, p. 52 (scales).

Hepsetia pinguis, Jordan and Hubbs, Stud. Ichth. Monogr. Rev. Atherinidae, 1919, p. 32 (part); McCulloch and Whitley, Mem. Qd. Mus. VIII, 1925, p. 140; McCulloch, Mem. Aust. Mus. V, 1929, p. 109 (Queensland refs. only).

Pranesus ogilbyi, Whitley, Mem. Qd. Mus. X, 28th August, 1930, p. 9 (Moreton Bay, Queensland). Type in Queensland Museum.

Ogilby (1912) has given a good description of this species, of which the holotype is in the Queensland Museum.

On 29th August, 1928, the North-eastern Moat was in places densely crowded, at low water, by schools of these fishes or "Hardiheads," as they are called, which rushed madly in groups, often breaking the surface or even leaping out of the water. Sea-birds,

sometimes harrassed by Frigate Birds, preyed on them from above. The terrified fishes sought shelter near coral blocks and even beside the boots of the writer, often colliding with his legs in their panic. They were then fairly easily caught with a hand-net. Later a Blacktip Shark began to feed on the fishes. The Hardiheads were also present in September, sometimes appearing in the Madrepore Moat, over rocks in the open sea nearby, or near the Crab Spit.

On 26th September these Atherines were very thick in the moats. In one open sheet of water leading into the mangroves the writer saw what looked like the shadow of a large tree on the water, but which on closer inspection resolved itself into a roughly diamond-shaped mass of Atherines, densely packed into an area of several square yards.

Four (I.4621-4624) in the Queensland Museum and ten (IA.4335-4337) in the Australian Museum from Low Isles.

Genus *Atherina*, Linnaeus, 1758.

Atherina lacunosa, Bloch and Schneider.

Four small specimens (IA.4464) from Low Isles.

Genus *Atherion*, Jordan and Starks, 1901.

Atherion maccullochi, Jordan and Hubbs.

This genus and species, characterized by the vent being near the anal fin and the lower part of head spiny, has not hitherto been recorded from Australia. One specimen (IA.2372), "caught a few yards from shore over a clean coral sand beach" by Dr. Paradise, and two specimens (IA.4472) 27-30 mm. in standard length, from Low Isles; caught at surface at night, 4th September, 1928. These have 42-43 transverse series of body-scales and 18-20 predorsal scales, eleven dorsal and sixteen anal rays, and have been compared with Lord Howe Island topotypes in the Australian Museum. *Atherina villosa*, Duncker and Mohr (Mitt. Zool. Mus. Hamburg, XLII, 1926, p. 135, fig. 10) is apparently congeneric.

Family MELANOTAENIIDAE.

Genus *Pseudomugil*, Kner, 1867.

Pseudomugil signatus (Günther).

Atherina signata, Günther, Ann. Mag. Nat. Hist. (3), XX, 1st July, 1867, p. 64. Cape York, Queensland (Damel). Type in British Museum; Macleay, Proc. Linn. Soc. N.S.W. VI, July, 1881, p. 40.

Pseudomugil signifer, McCulloch and Whitley, Mem. Qd. Mus. VIII, 1925, p. 140 (N. Queensland record only).

Pseudomugil signatus, Jordan and Hubbs, Stud. Ichth. Monogr. Rev. Atherinidae, 1919, p. 28.

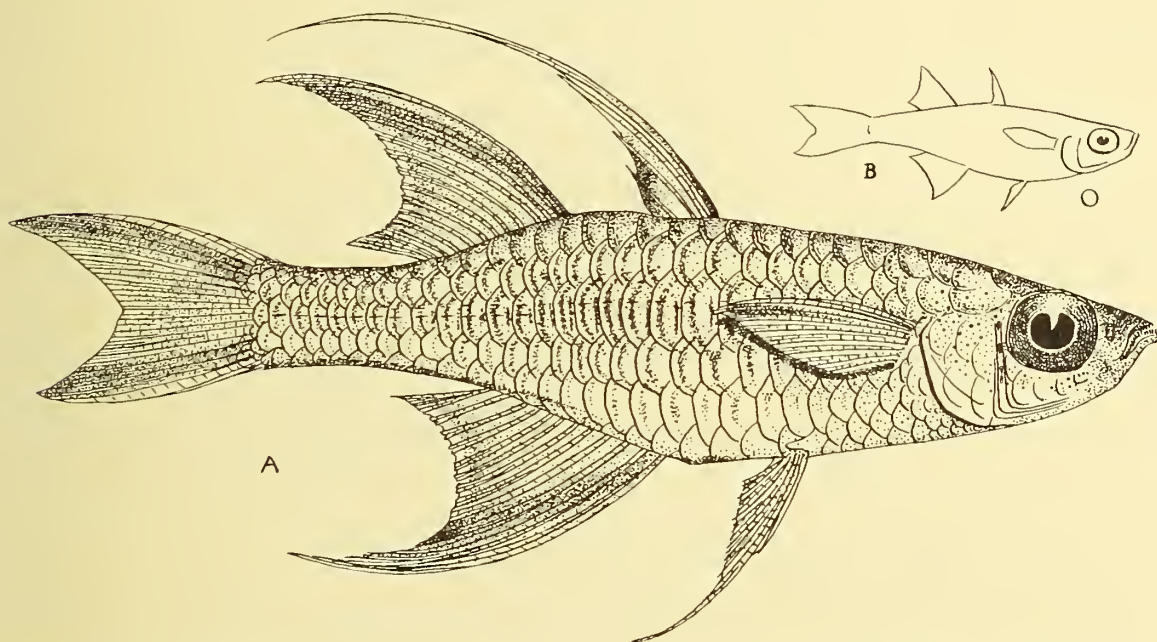
In shallow water near mangrove roots were thousands of these little fishes, which could be netted as they swam in schools.

COLOURS IN LIFE.—Olivaceous above, each scale with a darker edge; becoming white on sides and belly. A brownish lateral band posteriorly and some blue spots on sides

anteriorly. A median dark line along back. Head bluish-silvery with a red flush on operculum. Eye blue, with black pupil. First dorsal olivaceous, the spines darker. Second dorsal largely orange-yellow, with some anterior rays and their membranes blackish.

Anal rays smoky, the fin with a white margin. Median portion of caudal yellow; some upper and lower rays blackish with the top and bottom of the tail white-edged. Upper pectoral rays blackish, remainder of fin white (29th August, 1928).

Pseudomugil signatus is represented in the Australian Museum collections by ten specimens (I.9971) from freshwater near Townsville, Queensland, two (I.13634) from Dunk



TEXT-FIG. 2.—*Pseudomugil signatus* (Günther). A. A male from Low Isles (much enlarged); regd. no. IA.4340. B. A female from Low Isles with one of its ova (enlarged); regd. no. IA.4341. Drawings by Gilbert P. Whitley.

Island, and the series of forty-eight specimens (IA.4339–4343) from Low Isles noted above, of which a male (IA.4340) and a female (IA.4341) are here figured.

This species is allied to *Pseudomugil novaeguinae*, Weber. It was wrongly united with *P. signifer*, Kner (Reise Novara, Zool. 1867, p. 275, pl. xiii, fig. 5), by Günther (Zool. Record, 1867 [1868] p. 166), but Kner's Sydney species is less ornate in coloration than the northern form.

Family MUGILIDAE.

Genus *Ellochelon*, Whitley, 1930.

Ellochelon vaigiensis (Quoy and Gaimard).

Two small specimens (IA.4465) from Low Isles, September, 1928. When swimming, the young appear to have a black-margined, saddle-shaped light area on the back,

reminiscent of the markings of *Terapon servus*, but after death this colour-effect fades and the back becomes more regularly dusky.

All the specimens seen were of small size and swam in little schools, or in pairs, in the moats; they kept close together and sometimes congregated over hollows to feed upon matter in the sand (*cf.* Duncker and Mohr, Mitt. Zool. Mus. Hamburg, xlii, 1926, p. 131, figs. 4, 5).

Genus *Mugil*, Linnaeus, 1758.

Mugil delicatus, Alleyne and Macleay.

Mugil delicatus, Alleyne and Macleay, Proc. Linn. Soc. N.S.W. March, 1877, p. 341, pl. xv, fig. 1 (Cape York, Queensland). Types in Macleay Museum, University of Sydney.

D. iv/i, 8; A. ii/9; P. 17; V. i/5; C. 12.

Sc. 39 to hypural. L. tr. 15. Sc. $\frac{1}{2}/8\frac{1}{2}$ on caudal peduncle.

Head, 3 in.; length to hypural, $11\frac{1}{4}$; length to end of middle caudal rays, $12\frac{1}{2}$; depth $3\frac{1}{8}$; pectoral, $2\frac{3}{4}$; depth of caudal peduncle, $1\frac{3}{8}$; interorbital, $1\frac{1}{2}$.

A narrow eyelid present. Narrow lanceolate interspace on chin. Maxillary entirely covered by preorbital.

Preorbital covered by skin, with spaced serrations. No teeth in jaws or on palate. Symphysis of lower jaw elevated. Thickness of upper lip equal to pupil of eye. Gill-rakers very numerous and close-set, but not nearly as long as gill-fringes. About 21 predorsal scales. Cycloid scales on head. Small scales extend along dorsal, anal and caudal rays.

Last dorsal and anal rays divided. Axillary scales well developed. Tip of pectoral reaching vertical of dorsal origin.

Second dorsal slightly in advance of anal, subequal in height to first dorsal. Caudal peduncle not as long as head.

Soft dorsal, anal and caudal margins excavate.

COLOURS IN LIFE.—Dorsal scales olive grey, each one darker edged, with an infra-marginal lighter area. Lateral scales greyish-silver, and ventral scales silvery white; anal scales shot with blue. Dorsal fins smoky grey, a narrow lighter margin to soft dorsal. Caudal grey, shot with an electric blue and greenish sheen near bases of rays. Anal greyish, the spinous and marginal portions white. Ventrals white. Pectoral light smoky grey, darkest mesially and on border of first ray, with white edge and base. A blue-black axillary blotch. Upper portion of upper lip stippled smoky; rest of mouth, jaws, and membranes white. Top of snout darker than rest of head. The darker dorsal shade changes to white on the opercles on a level with the upper part of the eye and the pectoral blotch. Pupil black, surrounded by a white ring; rest of eye smoky brownish.

Described from one (IA.4483) of several specimens seen swimming in a thick scum of algae inshore at Low Isles on 22nd August, 1928, and speared by one of the aboriginals. Owing to its rather large size only the head and some scales were preserved, but a sketch and the above description were made in the field after its capture.

Other specimens in the Australian Museum from Cape York, and Murray Island, Queensland.

The Low Isles specimen agrees with description of *Mugil splendens*, De Vis, but I

have no specimens for comparison, and a sketch of the type shows a fish with Sc. 41 and a thicker upper lip. Jouan (Mém. Soc. Nat. Sci. Cherbourg, XXI, 1877, p. 333) regards *M. delicatus*, Alleyne and Macleay, as a synonym of *Mugil tegobuan*, Montrouzier (*i. e.* Thiollière, Ann. Sci. Phys. Nat. Agric. Lyon, VIII, p. 462, 1856: Essai Faun. Île Woodlark [Montrouzier], 1857, p. 184), but the latter is described as having teeth. Fowler (Mem. Bishop Mus. X, 1928, p. 124) unites *M. tegobuan* with *M. vaigiensis*, Quoy and Gaimard, and quotes Jouan in the synonymy.

Family EPINEPHELIDAE.

Genus *Epinephelus*, Bloch, 1793.

Epinephelus hoevenii (Bleeker).

(Plate II.)

? *Holocentrus caeruleopunctatus*, Bloch, Naturgesch. Ausl. Fische IV, 1790, p. 94, pl. cexlii, fig. 2. Locality unknown.

Serranus hoevenii, Bleeker, Verh. Batavia Genoot. XXII, 1849, Perc., pp. 19 and 36. Batavia.

Serranus kunhardtii, Bleeker, Natuurk. Tijdschr. Ned. Ind. II, 1851, p. 169. Padang, Sumatra.

Epinephelus hoevenii, Bleeker, Atlas Ichth. VII, 1875, p. 63, pl. cclxxxii, fig. 1, pl. cclxxxvi, fig. 4, and pl. ccxc, fig. 4 (plates published 1870). East Indies.

Epinephelus caeruleopunctatus, Boulenger, Cat. Fish. Brit. Mus. Ed. 2, I, 1895, pp. 171 and 246; McCulloch, Proc. Linn. Soc. N.S.W. XLVI, 1921, p. 468. Queensland, etc.

A specimen from Low Isles (IA.4426) figured here, has D. xi/16; A. iii/8; V. i/5; P. 17; C. 15. It was caught with a smaller one (IA.4427) under stones in September, 1928.

Another specimen (IA.4502), larger than the one figured but also from Low Isles, has the following characteristics: D. xi/16; A. iii/8.

Eye equal to snout, almost 5 in head, which is nearly 3 in total length. Depth of body less than length of head.

Maxillary with some rudimentary scales.

A single anterior canine on each side of the symphysis of each jaw. Teeth in broad bands on jaws, becoming caniniform behind symphyses and on sides of mandibles posteriorly. A few teeth on vomer and palatines.

Interorbital less than diameter of eye, over 8 in head.

Upper limb of preoperculum serrated. Middle opercular spine much nearer lower than upper.

Scales mostly ciliated, in less than eighty transverse series on body, the rows slanting upwards and backwards. About twenty scales between origin of dorsal and lateral line.

Third to last dorsal spines subequal but not as long as anterior dorsal rays. Margin of all soft fins rounded.

General colour (in spirit) brown, covered with whitish spots of various sizes, but all less than eye and becoming faint on head. A dark brown "moustache" and a small dark blotch over caudal peduncle. Pectorals, ventrals, and anal duskier than dorsals and caudal.

Epinephelus corallicola (Cuvier and Valenciennes).*

Serranus corallicola, Cuvier and Valenciennes, Hist. Nat. Poiss. II, October, 1828, p. 336. *Ex.* Kuhl and van Hasselt MS. No locality (= Java); Macleay, Proc. Linn. Soc. N.S.W. II, 1878, p. 346 (Port Darwin); Fowler, Mem. Bishop Mus. X, 1928, p. 181.

Epinephelus corallicola, Boulenger, Cat. Fish. Brit. Mus. Ed. 2, I, 1895, p. 236; McCulloch, Mem. Aust. Mus. V, 1929, p. 147.

Serranus rubriniger and *S. subniger*, Saville-Kent, Gt. Barrier Reef, 1893, p. 369. *Nomina nuda*. Queensland.

A specimen (IA.4456) from Low Isles has the following characters: D. xi/16; A. iii/8(9).

Interorbital width less than diameter of eye.

Preoperculum serrated, but without strong spines at angle.

Middle opercular spine nearer lower than upper. Opercular flap excavate above. Broad bands of teeth in jaws, caniniform anteriorly. Maxillary naked.

Eye between 4 and 5 in head.

Scales ciliated. 53-57 tubes in l. lat. to hypural. Sc. c. 65 to 70 from head to hypural. L. tr. 16/1/40-45.

Fourth dorsal spine longest, the posterior spines gradually decreasing in length. Caudal rounded.

Dark brown, with large, widely spaced, black spots on head, body, and the dusky fins. Caudal with narrow white margin.

Total length 152 mm. Registered number IA.4456.

New record for Queensland. Specimens from New Guinea and Port Darwin, identified by Sir William Macleay, compared in the Australian Museum. Two *nomina nuda* of Saville-Kent, *Serranus rubriniger* and *S. subniger*, may best be disposed of by being relegated to the synonymy of this species.

Epinephelus merra, Bloch.

Four specimens (IA.4457, 4486-8) of this common coral fish from Low Isles. Large specimens were seen hiding in empty clam-shells (*Hippopus*) near the mangroves; they looked rather like the mantles of the clams, which barely filled the shells.

Genus *Plectropomus*, Schinz, 1822.*Plectropomus maculatus* (Bloch).

A fine specimen (IA.4479) caught by Mr. Carl Vidgen off Low Isles.

* *Serranus australis*, Castelnau (Res. Fish. Aust. 1875, p. 7; C. York) is described with D. xi/13 and different coloration. The Low Island specimen has fewer spots and narrower pre-orbital than *Serranus howlandi*, Günther (J. Mus. Godeffroy, III [Fische Südsee], 1873, p. 8, pl. ix, fig. B; Howland Is.).

Family APOGONIDAE.

Genus *Lovamia*. Whitley, 1930.*Lovamia cookii* (Macleay).*Apogon fasciatus*, Alleyne and Macleay, Proc. Linn. Soc. N.S.W. I, 1877, p. 267 (Queensland). Not *Mullus fasciatus*, White, 1790.*Apogon cookii*, Macleay, Proc. Linn. Soc. N.S.W. V, February, 1881, p. 344 (Endeavour R. (type) and Darnley I., Queensland). Types in Macleay Museum, University of Sydney; *op. cit.* VII, 1882, p. 236 (Port Moresby, New Guinea); Fowler, Mem. Bishop Mus. X, 1928, p. 157.*Amia fasciata fasciata* McCulloch, Biol. Res. "Endeavour," III, 3, 1915, p. 116 (North Queensland specimens).*Apogon endekataenia*, Ogilby, Proc. Roy. Soc. Qd. XXI, 1908, p. 23 (Green I. and Dunk I., Queensland). Not *A. endekataenia* Bleeker, Natuurk. Tijdschr. Ned. Ind. III, 1852, p. 349, which has narrower stripes.

A Batt Reef specimen (IA.4065) agrees with other Great Barrier Reef examples in the Australian Museum in having D. vii/i, 9 : A. ii/9. Twenty-eight tube-bearing scales on l. lat. Pectoral base without dark mark. Bands of body not continued on to tail, but converging slightly above and below large black spot at root of caudal. McCulloch regarded the North Queensland species as conspecific with *Mullus fasciatus*, White, but Sydney specimens have a deeper body, smaller eye, median band continued on caudal fin and no blackish blotch at base of tail. *Amia robusta*, Radcliffe (Proc. U.S. Nat. Mus. XLI, 1911, p. 254, pl. xxiv, fig. 2), is apparently a Philippine subspecies of *Lovamia cookii*. The Batt Reef specimen agrees with Hombron and Jacquinot's figure of *Apogon aroubiensis* (Voy. Pôle Sud., Zool. III, Poiss. 1853, p. 31, pl. i, fig. 1) in having a short snout and large eye, also in general form, but their illustration shows neither the anterior intercalated dorso-lateral bands, nor the spot at the root of the caudal which is so characteristic of *Lovamia cookii*.

It may be of interest to record here that the type-locality of *Apogon aroubiensis*, originally called Aroub, Malaysia, is Darnley Island, Torres Strait, which is still called Aroub or Erub by North Queensland aborigines.

Lovamia cookii was common at Low Isles and Batt Reef and many young specimens (IA.4070, 4432, 4448 and 4504) were collected. These were found poised in swarms in still water sheltered by large blocks of coral such as *Porites*, or swimming between the long spines of sea-urchins (*Centrechinus setosus*), and could be caught in numbers with one sweep of a net. A series of nineteen specimens, 11–19 mm. long, caught in this way at Low Isles shows that the three main longitudinal bands, blotch at root of caudal and plain fins are juvenile as well as adult characters. The largest specimens have scales and incipient serrations on the preoperculum.

Weber and Beaufort (Fish. Indo-Austr. Archip. V, 1929, p. 306) regard *Apogon cookii* as a synonym of *A. endekataenia*, Bleeker, but although Bleeker's original description of the type from Banka agrees fairly well with the Queensland species, his figure (Atlas Ichth. VII, 1872, p. 85, plate cccx, fig. 2) shows a fish with much narrower bands on the body.

Genus *Foa*, Jordan and Evermann, 1905.

Foa vaiulæ, Jordan and Seale.

Three specimens (IA.4461) from Batt Reef, caught in trailing brown weed, 13th September, 1928, and one (I.14507) from Walker's Bay, near Cooktown, are in the Australian Museum. The latter specimen is 45 mm. in length and was collected by A. R. McCulloch. Another small one (IA.4473) from Low Isles is darkly mottled, with traces of a transverse band on body and an opercular spot.

This species has not hitherto been recorded from Australia.

The East Indian *Foa fistulosa*, Weber (Notes Leyden, Mus. XXXI, 1909, p 162, and Fische Siboga Exped. 1913, p. 237, and fig.) should receive a new generic name, as that species has a subcutaneous tube on the tail which is lacking in species of *Foa*.

Genus *Aspiscis*, Whitley, 1930.

Aspiscis savayensis (Günther).

One (IA.4503) from Low Isles ; amongst coral, reef flat, 1st October, 1928.

Family SILLAGINIDAE.

Genus *Sillago*, Cuvier, 1816.

Sillago gracilis, Alleyne and Macleay.

Sillago gracilis, Alleyne and Macleay, Proc. Linn. Soc. N.S.W. I, Feb. 1877, p. 279, pl. vi, fig. 2. Hall Sound, New Guinea or Darnley Island, Torres Strait, Queensland.

D. xi/i, 17 ; A. i/16. L. lat. 65 to hypural.

L. tr. 6/1/13.

Head (70 mm.) 3.3, depth (45) 5.1 in standard length (230). Interorbital (16) 4.3, eye (13) 5.3 in head.

Depth of caudal peduncle (21) less than postorbital portion of head (26). Preorbital (26) 2.7, pectoral (38) 1.9 in head.

Villiform teeth on jaws and roof of mouth.

Opercles entire.

Dorsals separate. First ventral rays with filiform tips.

The above are the characters of a specimen (IA.4481) caught on a small hook with mullet and pipi bait at Low Isles over sandy bottom inshore on 23rd August, 1928. A young one (IA.4466), with spotted body, was also obtained. The life colours of the larger specimen were as follows :

Light olive dorsally, darkest before the eyes. each scale with a darker margin. Ventral surface and most of sides white. First dorsal hyaline with large irregular smoky blotches. Second dorsal faint yellow with rows of smoky marks. Caudal light yellow, edged with smoky. Ventrals and anal white with a tinge of yellow. Pectorals hyaline with a blackish

blotch on base. Pupil black, rest of eye pearly with dark grey superiorly. A small grey mark near the root of each ventral.

Family LUTJANIDAE.

Genus *Lutjanus*, Bloch, 1790.

Lutjanus fulviflamma unimaculatus, Quoy and Gaimard.

One (IA.4478) from Low Isles agrees perfectly with Quoy and Gaimard's description. Very common over open waters with sandy bottom in vicinity of mangroves.

Family LEIOGNATHIDAE.

Genus *Equula*, Cuvier, 1816.

Equula, Cuvier, Mem. Mus. Hist. Nat. Paris, I, "1815" = March, 1816, pp. 463 and 466. Genotype. *Scomber equula*, Forskal [= *Equula equula* (Bonnaterre)].

Head about one-third of standard length. Preoperculum serrated. Mouth protractile obliquely downwards. Second dorsal spine not produced. Eight dorsal spines. Depth about half the length of the fish. A band of curved, bristle-like teeth in each jaw. Breast and thorax naked. Lateral line ceasing just before root of caudal. Supra-orbital finely denticulated. No conspicuous colour markings.

These characteristics define the genus *Equula*, Cuvier, as distinct from *Leiognathus*, Lacepède. I have in manuscript a revision of the family Leiognathidae based on the collections in the Queensland and Australian Museums, and intend to give details in that paper of the limits of the genera and subgenera, concerning which some complex points in taxonomy have arisen. Mr. H. A. Longman has kindly lent me the types of the species described by De Vis and by Ogilby, which I intend to redescribe and illustrate in due course.

Equula obscura (Seale).

(Plate III, fig. 1.)

Leiognathus obscura, Seale, Occ. Pap. Bishop Mus. I, 3, 1901, p. 74. Guam, Marianas.

A large specimen (IA.4498), netted offshore at Low Isles, 24th September, 1928, has the following characters:

D. viii/16; A. iii/14. Curved bristle-like teeth in jaws. Lower preopercular margin distinctly serrated, as long as mandible. Supraorbital weakly denticulated. Caudal fin strongly forked. Depth (95 mm.) 1.6 in standard length (155) or a little over 2 in total length ($7\frac{9}{16}$ in.). Longest dorsal spine (33) 1.3, and longest anal spine (26) 1.7 in head (46).

This is probably the species regarded as *Leiognathus equula* by Australian writers. The figure of *Equula edentula* in Day's Fishes of India is very like the Low Isles specimen,

which only seems to differ in colour and minor features. However, *Equula edentula*, Day, is not the same as *Scomber edentula*, Bloch, but is apparently *Equula coma*, Cuvier; this point will be more fully discussed in my forthcoming paper on the family Leiognathidae. Fowler (Mem. Bishop Mus. X, 1928, p. 153) unites *Leiognathus obscura*, Seale, with the Red Sea species described by Forskål which I regard as *Equula equula* (Bonnaterre), but the Pacific form appears to be at least subspecifically distinct.

Family GERRIDAE.

Genus *Gerres*, Quoy and Gaimard. 1824.

Gerres splendens, De Vis.

Gerres splendens, De Vis, Proc. Linn. Soc. N.S.W. IX, 19th August, 1884, p. 400. Cardwell, Queensland. Holotype in Queensland Museum; Whitley, Mem. Qd. Mus. X, 1930, p. 15, fig. 1 (holotype redescribed and figured).

A series of sixteen specimens from Low Isles mangrove swamps (IA.4331-4334) and two collected by Dr. Paradise from the same locality (IA.1697) have been compared with the type in the Queensland Museum. Young ones have the depth a little more than 3 in length to end of middle caudal rays, but in adults it is 3 or even a trifle less. Dorsal generally ix/10; only one has D. ix/11 and another D. ix/9. Second dorsal spine a little over 2 in depth of body. Suborbital and opercles smooth. L. lat. usually 41; rarely 40, sometimes 42 and occasionally 43-44.

Eye longer than snout and than anal spines. Pectoral not quite reaching anal origin. Upper caudal lobe subequal to head. Tip of first dorsal black; some dark spots on dorsal rays. Young bright silvery in general colour; adults with no spots on body, but sometimes with indistinct bars of darker scales.

This is perhaps one of the species regarded by Australian authors as *Labrus oyena*, Forskål.

Three post-larvae of this species (IA.4471, 4476) were tow-netted at night on 8th September, 1928. One very small specimen had a parasite like *Gnathia* near the tail. The majority of the larger specimens was obtained by making the water muddy by stirring up the bottom with the feet when wading; the fish were thus stupified and could be easily netted.

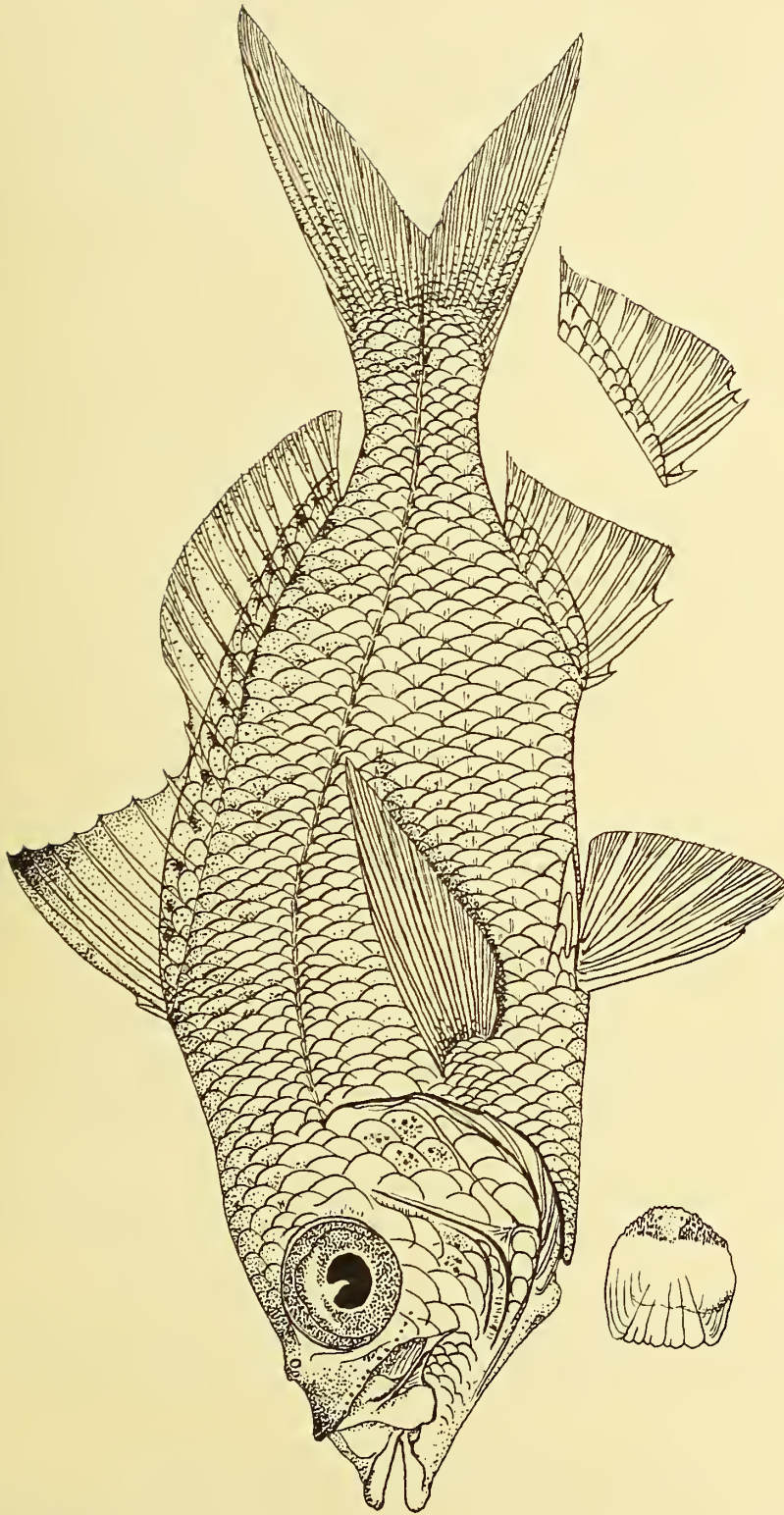
One specimen (IA.4614) was caught by seine net at North-West Islet, Capricorn Group, in May, 1930, by Mr. Melbourne Ward, so that this species evidently extends its range all along the Queensland coast.

Family CHAETODONTIDAE.

Genus *Chaetodon*, Linnaeus, 1758.

Chaetodon lunula (Lacepède).

A juvenile specimen in the "*Tholichthys*" stage (IA.4078) was caught beneath a boulder on the reef at Low Isles. It agrees with Günther's figure (Fische der Sudsee,



TEXT-FIG. 3.—*Gerres splendens*, De Vis. A specimen from Low Isles. Regd. no. IA.4333.
Also a lateral scale of the same specimen and the normal form of anal fin drawn from a larger specimen from the same locality. Drawings by Gilbert P. Whitley.

pl. xxxiii, fig. D), but, as is sometimes the case in young specimens of this species, it lacks the dorsal ocellus.

COLOURS IN THE FRESH STATE.—General body colour pale yellow. Face whitish. The broad black ocular bands form a V-shaped mark on the breast before the ventrals; above the eye each band becomes browner with a lighter median area, and there is a blackish superciliary mark. Some black punctulations on the operculum and shoulder and above anal fin. An irregularly saddle-shaped blackish area below the hinder part of the dorsal and a narrow band around the caudal peduncle. First dorsal, ventrals and anterior portion of anal yellow. Pectorals, soft dorsal, caudal and posterior portion of anal hyaline.

Chaetodon vagabundus, Linnaeus.

One specimen from Low Isles, collected by Mr. F. W. Moorhouse, in the Queensland Museum (I.4589).

Genus *Rabdophorus*, Swainson, 1839.

Rabdophorus bennetti (Cuvier and Valenciennes).

Chaetodon bennetti, Cuvier and Valenciennes, Hist. Nat. Poiss. VII, 1831, p. 84; Sumatra; Fowler and Bean, Bull. U.S. Nat. Mus. 100, VIII, 1929, p. 73 (references and synonymy).

One young specimen (IA.4455) of this well-marked species from Low Isles.
New record for Australia.

Genus *Megaprotodon*, Guichenot, 1848.

Megaprotodon plebeius (Cuvier and Valenciennes).

Chaetodon plebeius, Gmelin, Syst. Nat. (Linnaeus), ed. 13, I, 3, 1789, p. 1269, footnote; *ex* Broussonet MS.; *nom. nud.*

Chaetodon plebeius, Cuvier and Valenciennes, Hist. Nat. Poiss. VII, April, 1831, p. 68; *ex* Broussonet MS. Mer du Sud; Fowler and Bean, Bull. U.S. Nat. Mus., 100, VIII, 1929, p. 78.

A juvenile specimen (IA.4069) 15 mm. in total length from Batt Reef.

Genus *HOLACANTHUS*, Lacepède, 1802.

Holacanthus sexstriatus, Cuvier and Valenciennes.

A large specimen from Low Isles in the Queensland Museum (I.4586). Another recorded from the same place by Tandy (Nat. Hist. Mag., London, July, 1929, II, p. 87, fig. 5).

Subgenus *Acanthochaetodon*, Bleeker, 1876.

Holacanthus (Acanthochaetodon) semicirculatus, Cuvier and Valenciennes.

One in the Queensland Museum (I.4639) from Low Isles.

Family SCOMBEROMORIDAE.

Genus *Scomberomorus*, Lacepède, 1802.*Scomberomorus commerson* (Lacepède).

Some fisherman caught twenty-six Kingfish of this species near Snapper Island on 5th September, 1928. No specimens were preserved, but the following notes were made at the time.

"These fish were about nine or ten pounds in weight when cleaned and were developing the reproductive organs. The fishermen say they begin to get them here about June or July when they come up from the south. In about another month they will be larger and mature and will spawn about November. They are caught here until December, when they go south again.

"A lily or a piece of white or red rag is used as bait and trolled behind a launch. Kingfish bite very ferociously and are often caught in numbers. They do not stay long in one place, however, and may not be encountered the day after a good catch has been made."

Family AMPHACANTHIDAE.

Genus *Amphacanthus*, Bloch and Schneider, 1801.*Amphacanthus lineatus*, Cuvier and Valenciennes.*Amphacanthus lineatus*, Whitley, Rec. Aust. Mus. XVI, 1928, p. 231 (synonymy and localities).

A specimen from Low Isles (IA.4054).

Family AMPHIPRIONIDAE.

Genus *Amphiprion*, Bloch and Schneider, 1801.*Amphiprion bicinctus*, Rüppell.

I am informed that Dr. T. A. Stephenson collected this species at Low Isles from a sea-anemone (*Stoichactis*).

Genus *Actinicola*, Fowler, 1904.*Actinicola percula* (Lacepède).

(Plate I, fig. 2.)

Three Batt Reef specimens (IA.4062-4064) have D. x/16; A. ii/13; light snout, breast and pectorals; areas between dark-edged bands, pectorals, and most of caudal light in tone. They were collected by Messrs. McNeill and Livingstone, who noted them as commensals of an anemone.

Two specimens (I.4640-4641) in the Queensland Museum from Low Isles.

HABITS.—*Actinicola percula* was fairly common at Low Isles associated with the large sea-anemones (*Stoichactis*). Registered numbers of specimens preserved IA.4062-4, 4092. I made the following field observations on them :

The fish swims by turning body and tail to left, at the same time bringing left pectoral to side, then repeats action on right side. The ventral fins are kept extended all the time the fish is swimming as if feeling for bottom and are rarely moved ; this is a noteworthy feature in *Actinicola* and *Amphiprion*. The dorsal and anal are kept extended and lean from one side to another. A specimen kept in a bottle overnight was still active next morning, a feat of hardiness rare in a coral-reef fish, but probably this species has to withstand great changes of salinity, temperature, etc. I placed it amongst the tentacles of a different anemone on another part of the reef. After swimming about for some time as if to get its bearings, the fish snuggled into the tentacles, gently waving its fins, or else sheltered in the folds of the anemone, but I could not induce it to enter the anemone's mouth. The fish adopted its new host and was always to be found with it during my stay at Low Isles, and I added further specimens from time to time. *Actinicola percula* is sometimes accompanied by one or more prawns (*Periclimenes*) in association with an anemone, although the view is popularly held that the two organisms are not found together with their host. A photograph by Mr. W. Boardman of the fish and an anemone *in situ* is reproduced here.

An early figure of this species was given by Valentyn (Amboina, III, 1726, fig. 525) and a Great Barrier Reef specimen was artistically described by Hedley (The Nautilus, XV, 1902, 9, p. 99.)

JUVENILE SPECIMENS.—At Batt Reef on 13th September, 1928, I collected in a small sea-anemone which differed from the large Low Isles species two small specimens of *Actinicola percula* (IA.4063-64). These were more active swimmers than the adult forms and there were no prawns with them. D. x/16 ; A. ii/13-14. Yellow on snout, breast, margin of pectorals and lower half of caudal peduncle ; areas between the two white bands crossing the body dark brown ; upper rays of caudal white, lower part of caudal mostly black ; pectorals mostly blackish. The blackish band passing through the eye does not join its fellow on the other side below the head. This is the juvenile colour-phase of the species, and has been figured in colours by Saville-Kent (*loc. cit.*) as *Amphiprion clarkii*. That species, however, was originally described as *Anthias clarkii* by Bennett (Fish Ceylon, April, 1830, p. 29, pl. xxix) and is a true *Amphiprion* with emarginate tail, deep body and scaly nape, and has not been found in Australian waters.

Family POMACENTRIDAE.

Subfamily Pomacentrinae.

Genus *Pseudopomacentrus*, Bleeker, 1877.

Pseudopomacentrus sufflavus (Whitley).

Mr. F. S. Russell obtained one specimen (IA.4429) at Low Isles. This species, which has the outer row of teeth conic terminally, not forming a compact cutting edge, is allied

to *P. amboinensis* (Bleeker), but has origin of dorsal further back and depth 2 in standard length. In the shape of the tail and less deep body, *P. sufflavus* differs from *P. niomatus* (De Vis), but the three species are evidently quite closely related. Nevertheless, they are still too close to the typical *Pseudopomacentrus (littoralis)* to be considered even subgenerically distinct at present.

Pseudopomacentrus wardi macleayi (Whitley).

Pomacentrus obscurus, Alleyne and Macleay, Proc. Linn. Soc. N.S.W. I, March, 1877, p. 343, pl. xv, fig. 2. No locality (= Torres Strait, probably Darnley Island). Types in Macleay Museum, University of Sydney; lectotype described below. Name preoccupied by *Pomacentrus obscurus*, Thiollière, Ann. Agric. Soc. Lyon, VIII, 1856, p. 400; Essai Faune Île Woodlark (Montrouzier), 1857, p. 200; McCulloch and Whitley, Mem. Qd. Mus. VIII, 1925, p. 166.

Pomacentrus wardi, Whitley, Rec. Aust. Mus. XV, 6th April, 1927, p. 301, fig. 1; Heron I., Queensland. Holotype in Australian Museum: Whitley, Rec. Aust. Mus. XVI, 1927, p. 17 (Michaelmas Cay—variation).

Pomacentrus macleayi, Whitley, Rec. Aust. Mus., XVI, 28th March, 1928, p. 221; Torres Strait. New name for *P. obscurus*, Alleyne and Macleay, preoccupied.

Pseudopomacentrus macleayi, Whitley, Mem. Qd. Mus. IX, 1929, p. 236.

Pseudopomacentrus wardi, Whitley, Mem. Qd. Mus. IX, 1929, p. 237.

D. xiii/14; A. ii/13; P. i/17; V. i/5; C. 13.

17 tubes on l. lat. Sc. 24; L. tr. 2/1/9.

Head (17 mm.) 3.6 in length to hypural joint (62); depth (24) 2.5 in same. Snout (4) 1.2 in interorbital width (5), which is a trifle less than eye (5.5). Depth of caudal peduncle (8) 8.5 in total length (69).

Head scaly except on preorbital, jaws and throat. Rows of pores along the preorbital, whose margin is serrated and notched. Preoperculum strongly serrated. Two small opercular spines. Eye large. Interorbital convex. Mouth small, maxillary not reaching vertical of anterior margin of eye. A single series of compressed incisors in each jaw.

Form ovate, compressed. Body covered with ctenoid scales which extend on to all the fins except ventrals. About nineteen predorsal scales. Lateral line gently curved. Caudal peduncle not tapering abruptly.

Dorsal originating in advance of pectorals, its spines increasing in height backwards and interspaced with pencilled membranes; the soft dorsal terminates behind the anal. Caudal forked, the upper lobe longer.

Colour (after long preservation in alcohol) uniform straw-brownish with the ventrals and anal darker. A small black spot, margined anteriorly with white, on the caudal peduncle behind the last dorsal ray.

Described from the lectotype of *Pomacentrus obscurus*, Alleyne and Macleay, or the holotype of *P. macleayi*, Whitley. The specimen is $2\frac{3}{4}$ in. long and was figured by Alleyne and Macleay. It is one of four Torres Strait specimens which have been kindly lent me by the Curator of the Macleay Museum, University of Sydney, to whom I wish to record my thanks.

P. obscurus = macleayi is closely allied to *P. wardi*, and, after having compared many specimens of both forms, I have arrived at the conclusion that two subspecies are represented which may be distinguished as follows:

- A. Depth 2 or less in length from snout to hypural joint. Usually 15 dorsal rays. Coloration brownish, no spot on caudal peduncle *P. wardi wardi*.
 A.A. Depth more than 2 in length to hypural. 13 to 14 dorsal rays. Coloration olivaceous; most specimens with a black spot, margined with white anteriorly, on caudal peduncle behind last dorsal ray *P. wardi macleayi*.

Thus, *Pseudopomacentrus wardi macleayi* is evidently a northern subspecies ranging from Torres Strait down to the Whitsunday Passage, whilst *P. wardi wardi* extends from the latter place to the southernmost islets of the Great Barrier Reef.

These forms are so close to *Pomacentrus trilineatus*, Bleeker (Atlas Ichth., IX, 1877, pl. cccvi, figs. 1-6; *non* Cuvier and Valenciennes, *s. str.*), and *P. niomatus*, De Vis (Proc. Linn. Soc. N.S.W. VIII, 1884, p. 451; Whitley, Mem. Qd. Mus. IX, 1929, p. 220, fig. 2), that they would be regarded as conspecific by the casual worker, but, after examining large series of Australian specimens, I am convinced that no good purpose can be served by uniting them, as many more races, varieties and subspecies of these fishes appear to exist within geographical limits than are at present recognized.

Pseudopomacentrus wardi macleayi was common at Low Isles, where the aborigines called it "young bluefish." It sheltered beneath boulders at low water and could be easily netted. The general coloration was olive greenish, often irregularly blotchy. Others are described in my notes as "dark olive greenish, each scale grey-edged." A small specimen had a tiny violet spot at the termination of the dorsal fin. There is a tendency towards a light inframarginal band along the spinous dorsal, whilst the anal and ventrals are darker.

Thirty-one specimens (IA.4080-4086) from Low Isles in the Australian Museum and three (I.4498-4500) in the Queensland Museum.

A specimen collected at Low Isles by Dr. Paradise (IA.1699) and another from Port Darwin (IA.3603) have a black ocellus on the median dorsal rays and three rows of scales on the cheeks. These specimens are 36 mm. in standard length.

Subfamily *Glyphisodontinae*.

Genus *Glyphisodon*, Lacepède, 1802.

Glyphisodon palmeri, Cockerell.

Two specimens from Low Isles (IA.4330 and 4484).

RANGE.—North Australia and Queensland.

Glyphisodon coelestinus, Cuvier and Valenciennes.

One specimen (IA.4097) from Low Isles, August, 1928.

Genus *Glyphidodontops*, Bleeker, 1877.

Glyphidodontops biocellatus (Quoy and Gaimard).

Glyphisodon biocellatus, Quoy and Gaimard, Voy. Uranie and Physicienne, Zool., 1825, p. 389; Guam.

Glyphisodon antjerius, Cuvier and Valenciennes, Hist. Nat. Poiss. V, July, 1830, p. 481; *ex* Kuhl and van Hasselt MS.; Java.

Abudefduf biocellatus, Fowler and Bean, Bull. U.S. Nat. Mus. 100, VII, 1928, pp. 124 and 166 (references and synonymy).

One small specimen (IA. 4433) is referred to this species : it agrees with the form called *Glyphisodon antjerius*. New record for Australia, since the species identified as *G. antjerius* from New South Wales is the young of *Parma*. I regard *Chaetodon brownriggii*, Bennett, (Fish. Ceylon, June, 1828, p. 8. pl. viii : Ceylon), as distinct.

The following notes were made on 21st September, 1928, after the specimen had been kept alive in a finger-bowl overnight :

LIFE COLOURS.—Dark olivaceous on top of head and back ; brilliant yellow on lower parts of head, sides, and caudal peduncle. Two brilliant blue bands on each side of snout ascending obliquely backwards ; the lower one passes through the dark bluish eye. A large black ocellus on second dorsal, surrounded by brilliant blue. Anterior dorsal rays bluish, posterior rays orange-yellow. Ventrals and anal orange, some of the rays black-tipped. Pectorals and caudal hyaline.

This species was sometimes seen swimming slowly near banks of coral in the inner rampart and madrepora moat, but was difficult to catch as it could hide amongst the most inaccessible coral branches or take short cuts through the smallest gaps. Others fed on minute material on the coral debris banks flanking the edge of the mangrove swamp associated with other Pomacentridae.

Family CHROMIDAE.

Genus *Chromis*, Cuvier, 1814.

Chromis nitidus (Whitley).

Tetradrachmum nitidum, Whitley, Rec. Aust. Mus. XVI, 1928, p. 219, pl. xvii, fig. 3 ; Hayman Island, Queensland.

One young one (IA. 4449) from Batt Reef, 13th September, 1928. Several young were swimming round blocks of *Porites* and, as this was the first time I had seen this species alive, I noted that the top of the head was brilliant yellow margined by a black band. Sides silvery and, by contrast, almost invisible in the water. Closer inspection revealed the dark streaks on the anal and caudal fins. This species was also common on an uncharted reef between Batt and Tongue Reefs, visited 27th September.

Genus *Tetradrachmum*, Cantor, 1849.

Tetradrachmum aruanum (Linnaeus).

Two (IA.4095–4096) from Low Isles.

Genus *Hoplochromis*, Fowler, 1918.

Hoplochromis caeruleus (Cuvier and Valenciennes).

Two (IA.4061) from Batt Reef.

Family LABRIDAE.

Genus *Hemigymnus*, Günther, 1861.Subgenus *Cheilolabrus*, Alleyne and Macleay, 1877.*Hemigymnus (Cheilolabrus) melapterus* (Bloch).

One young specimen (IA.4428) agreeing with Bleeker's figure (Atlas Ichth., I, 1862, p. 412, pl. xlv, fig. 3) from coral block in the madreporo moat, Low Isles.

Cheilolabrus, Alleyne and Macleay, 1877, may be used subgenerically for the species lacking several whitish transverse bands. This name was amended to *Chi(lolabrus)* on p. 2 of the Index to the Zoological Record for 1877 (published 1879). *Thalliurus*, Swainson, 1839, was proposed for *C(heilinus) blochii*, Swainson [not Cuvier and Valenciennes, 1839 (= *Hemigymnus fasciatus*)], based on *Labrus chlorourus*, Bloch, 1791, which is not congeneric with *Hemigymnus*.

Family JULIDAE.

Genus *Octocynodon*, Fowler, 1904.*Octocynodon margaritaceus* (Cuvier and Valenciennes).

One (IA.4453) from Low Isles. This species has been called *Halichoeres opercularis* by Australian authors.

Octocynodon miniatus (Cuvier and Valenciennes).

Three (IA.4454) from Low Isles.

Genus *Guntheria*, Bleeker, 1861.*Guntheria trimaculata* (Griffith).

One (IA.4505) from Batt Reef; 13th September, 1928. D. ix/11; A. iii/11.

Family CORIDAE.

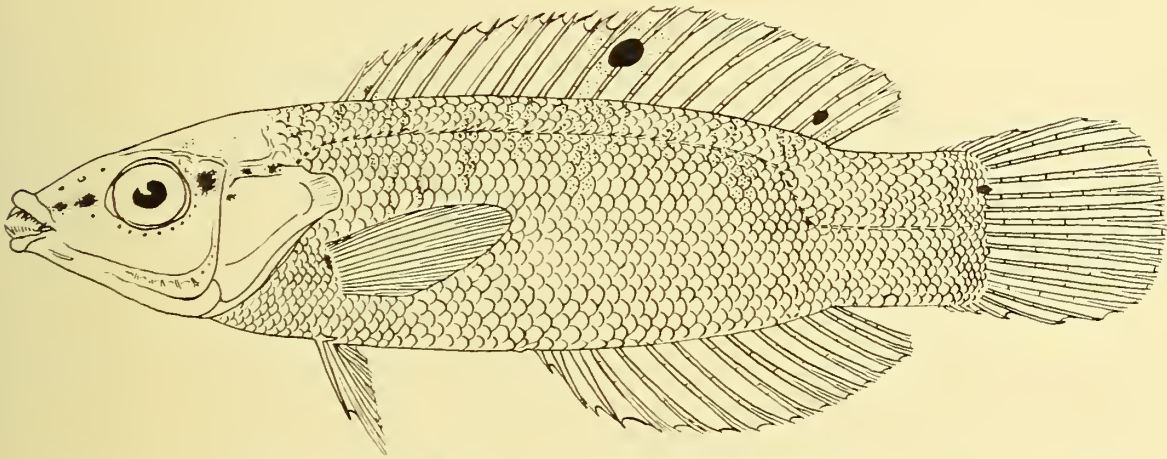
Genus *Hemicoris*, Bleeker, 1861.*Hemicoris pallida* (Macleay).

Coris pallida, Macleay, Proc. Linn. Soc. N.S.W. VI, July, 1881, p. 100; Endeavour River, Queensland. Holotype in Macleay Museum, University of Sydney.

Two small specimens (IA.4460) from a trailing brown seaweed on sandy bottom at Batt Reef, 13th September, 1928. A larger specimen is in the Australian Museum from Murray Island, Queensland.

CHARACTERS.—Cheeks naked. Preoperculum entire. Depth less than length of head and less than 5 in total length. Lateral line continuous, bent abruptly behind, with fifty-six scales, of which forty are on the straight anterior portion. L. tr. 6/20. D. ix/11; A. iii/11. No produced dorsal spines. Caudal rounded. Pectoral subequal to distance from posterior margin of eye to snout.

General colour, in spirits, yellowish brown, silvery on thorax and with five or six faint dusky transverse bars, with traces of white intermediate bars, on body. Eye surrounded by milky-blue, forming a post-orbital mark. No marks on cheek, but one specimen has a dusky pre-orbital blotch. A black spot between the first and second dorsal spines, a larger white-edged one on second dorsal ray, and a small spot between ninth and tenth dorsal rays. A black dot on upper half of caudal root. A dark brown bar on pectoral base.



TEXT-FIG. 4.—*Hemicoris pallida* (Macleay). A specimen from Batt Reef. Regd. no. IA.4460.
Drawing by Gilbert P. Whitley.

This species is near *Halichoeres variegatus*, Rüppell (Neue Wirbelth. Abyssin. Fische, 1835, p. 14, pl. iv, fig. 2), from the Red Sea, but differs in coloration, and in having a narrower cheek and one dorsal ray less.

Family BODIANIDAE.

Genus *Choerodon*, Bleeker, 1845.

Choerodon, sp. juv.

D. 13/7; A. 3/10. L. lat. 29; L. tr. 2/1/7.

Cheeks narrow. Maxillary not reaching eye. A confluent series of pointed teeth in each jaw. Two enlarged teeth near symphysis of upper jaw and about four near that of lower. Preoperculum with about a dozen serrations on its vertical limb. Opercles scaly and with a long and broad rounded flap.

Depth (5 mm.) 2.9 in standard length (14.5).

Lateral line continuous, not bent abruptly. Scales large, entire, leaf-like, not forming sheaths for fins.

Ventrals not reaching anal.

General colour yellowish with a green tinge on the fins. A dusky tinge on anterior portions of dorsal and anal, middle portion of ventrals, and base of lowest caudal ray. Tips of ventrals white. A large silver blotch on cheeks and another before pectoral base.

One small specimen (IA.4475) standard length 14.5 mm.; total length $\frac{3}{4}$ in.; found under a stone on reef flat, 6th September, 1928. This is evidently the greenish post-larval form of some species of *Choerodon*, but I am unable to identify it specifically.

Family OPISTHOGNATHIDAE.

Genus *Tandya*, Whitley, 1930.

Tandya maculata (Alleyne and Macleay).

Opisthognathus maculatus, Alleyne and Macleay, Proc. Linn. Soc. N.S.W., I, February, 1877, p. 280, pl. ix, fig. 3; Palm Is., N.Qd. ("Chevert" Expedition).

Batrachus punctatulus, Ramsay, Proc. Linn. Soc. N.S.W. VIII, 19th June, 1883, p. 177; Torres Strait, N.Qd. Type (I.1254) in Australian Museum, Sydney. Name emended to *B. punctulatus* by authors.

Gnathypops maculatus, McCulloch, Rec. W. Aust. Mus., I, 1914, p. 216.

Gnathypops maculata, Ogilby, Mem. Qd. Mus. VII, 30th June, 1920, p. 27, pl. iii (description and figure of Arn I. specimen).

Tandya maculata, Whitley, Mem. Qd. Mus. X, 1930, p. 19.

A large female from Low Isles (IA.4051) compared with the type of *Batrachus punctatulus* in the Australian Museum.

RANGE.—North Australia, Queensland, and Aru Islands.

Family PARAPERCIDAE.

Genus *Parapercis*, Bleeker, 1863.

Parapercis cylindrica (Bloch).

Five specimens (IA.4450–2) of this common Queensland fish from Low Isles. D. v/21; A. i/17; teeth on vomer and palatines.

Family CALLIONYMIDAE.

Genus *Callionymus*, Linnaeus, 1758.

Callionymus calliste, Jordan and Fowler.

Callionymus calliste, Jordan and Fowler, Proc. U.S. Nat. Mus. XXV, 1903, p. 954, fig. 8; Misaki, Japan.

Head and anterior part of body strongly depressed. A pair of granulated raised occipital areas behind eyes. Preopercular spine with three large hooks above and an antrorse barb below. Interorbital very narrow. Four dorsal spines, connected by

membrane to their tips, the first longest, nearly equal to distance from posterior orbital border to tip of snout. Soft dorsal separate, with eight simple rays, the last one divided to its base, longer than last anal ray, and reaching to base of upper caudal ray. Anal originating below first dorsal ray, with seven rays, similar to those of dorsal. P. 18; V. i'5. Ventral membrane covering bases of lower pectoral rays.

General colour sandy brown on back, with irregular mottlings formed by closely grouped blackish punctulations or with creamy spots partly enclosed in dark crescentic borders. Ventral surface plain whitish or yellowish. A series of ill-defined fuscous cross-bars on body and a row of dark spots on sides below lateral line. Two upright dark stripes on cheek and another on each pectoral base. All fins speckled blackish except anal, which is plain. A row of larger spots on lower half of caudal and a cream spot at root of that fin. Some cream and black spots on ventrals and a larger black spot near tip of longest ray.

Described from a small specimen (IA.4463), 32 mm. in standard length or $1\frac{5}{8}$ in. in total length, from Batt Reef, Queensland. This is evidently a young female of *Callionymus calliste*, Jordan and Fowler, the only major differences between my specimen and the account of that species being eye longer than snout and about one-third length of head, last dorsal ray longer than last anal ray, and caudal more rounded. A similar specimen (IA.4630) from Low Isles.

New record for Australia.

Specimens identified as *Callionymus microps*, Günther, from Michaelmas Cay are quite different from *C. calliste*, being plumper and much darker in colour.

Callionymus japonicus scaber, McCulloch, from Lord Howe Island, *C. lunatus*, Temminck and Schlegel, and *C. valenciennesii*, Temminck and Schlegel, from Japan, were included by error in a key to the Australian species of *Callionymus* by McCulloch (Biol. Res. Endeavour, V, 1926, pp. 195-196). None of these species is yet certainly known from Australian waters.

Family SALARIIDAE.

Key to Australian Genera of the Subfamily Salariae.

- A A row of cirrhi crossing the neck to the opercular lobes
Cirripectus, Swainson, 1839.
- A.A. No such row of cirrhi, but a single tentacle may be present on each side of the nuchal region.
- B. Each side of mandible with a row of small teeth; no canines
Ecsenius, McCulloch, 1923.
- B.B. Each side of mandible either toothless or with a single canine.
- C. Dorsal fin not incised between spines and rays. Canines very small or absent
Salarias, Cuvier, 1816.
- C.C. Dorsal fin incised between spines and rays. Canines usually present.
- D. Seventeen dorsal and nineteen anal rays
Negoscartes, Whitley, 1930.
- D.D. Nineteen or more dorsal and anal rays.
- E. Upper lip crenulated
Crenalticus, Whitley, 1930.
- E.E. Upper lip entire
Rupiscartes, Swainson, 1839.
(Syn. "*Alticus*" [Comm.], Lac., 1800).

Genus *Salarias*, Cuvier, 1816.*Salarias fasciatus lineolatus*, Alleyne and Macleay.

Blennius fasciatus, Bloch, Naturgesch. ausl. Fische, II, 1786, p. 110, pl. clxii, fig. 1; East Indies and Japan.

Salarias lineolatus, Alleyne and Macleay, Proc. Linn. Soc. N.S.W. I, March, 1877, p. 336, pl. xiii, fig. 2; Darnley Island, Queensland.

Salarias fasciatus, McCulloch, Rec. Aust. Mus. XIV, 1923, p. 123, pl. xv, fig. 3; Two Isles, Qd.

In his original account and figure, Bloch gives D. 29 and A. 19. The Queensland form of this species has D. xii-xiii/18-19; A. ii/19-20. A comparison of McCulloch's figure with that of Bloch shows marked differences in pattern and the vent midway between forehead and tail in the Australian form, which may be known subspecifically by Alleyne and Macleay's name.

Four (IA.4438-4440) from Low Isles; western moat, 9th September, 1928, and on reef flat, 14th September.

Genus *Negoscartes*, Whitley, 1930.*Negoscartes irroratus* (Alleyne and Macleay).

One (IA.4441) Low Isles; another specimen (IA.4013) collected in General Survey. This is the type-locality of this species.

Genus *Crenalticus*, Whitley, 1930.*Crenalticus meleagris* (Cuvier and Valenciennes).

Ten (IA.4442-3) from Low Isles; one specimen (IA.4014) collected in General Survey at Three Isles.

Two (IA.4444) from Snapper Island.

The type probably came from north-western Australia or Timor, so that Queensland forms may prove to be subspecifically distinct; in this case a new name may be required.

Genus *Rupiscartes*, Swainson, 1839.*Rupiscartes lineatus* (Cuvier and Valenciennes).

One (IA.4437) from amongst rocks, the boulder track, Low Isles, 4th September, 1928.

Subfamily *Petroscirtinae*.Genus *Petroscirtes*, Rüppell, 1830-1.*Petroscirtes hypselopterus*, Bleeker.

Petroscirtes hypselopterus, Bleeker, Natuurk. Tijdschr. Ned. Ind. VIII, 1855, pp. 393, 399 and 423; Amboina.

This species, obtained at Low Isles, has not hitherto been recorded from Australia.

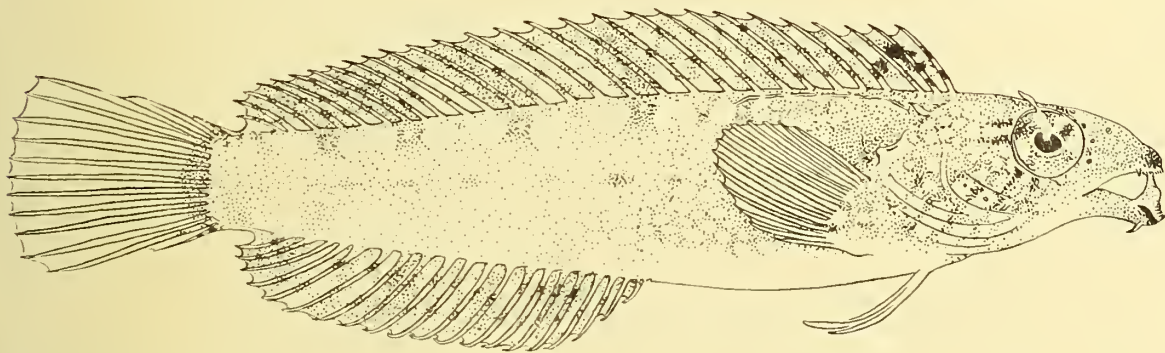
D. iii/23 ; A. i/5 ; V. 3 ; P. 15 ; C. 11. Jaws each with a single series of immovable incisors and large lateral canines.

Branched tentacles over eye, other smaller tentacles on cheeks, around chin. Maxillary extending to below anterior third of eye. Interorbital concave, half diameter of eye, which is equal to snout. Gill-opening small, above pectoral base.

Body naked ; lateral line almost obsolete, near back. Depth 4 in standard length. Head 3·7 in same.

Anterior three dorsal spines elevated and separated from the rays by a notch. Caudal rounded.

Ground-colour yellowish, densely marbled with black and brown to form a complicated marmorated pattern. Head and breast white-spotted. Two from Low Isles (IA.4445-6).



TEXT-FIG. 5.—*Petrosirtes viperidens* (De Vis). A specimen from Batt Reef. Regd. no. IA.4896. Drawing by Gilbert P. Whitley.

Petrosirtes viperidens (De Vis).

Salarias viperidens, De Vis, Proc. Linn. Soc. N.S.W. IX, 29th November, 1884, p. 697. Somerset, Cape York, Queensland. Types in Queensland Museum ; co-types in Australian Museum ; De Vis, Proc. Roy. Soc. Qd. II, 1886, p. 59.

Petrosirtes viperidens, McCulloch and McNeill, Rec. Aust. Mus. XII, 4th February, 1918, p. 23.

The accompanying figure is from a Batt Reef specimen (IA.4896), which has the following characters : D. 28 ; A. 20 ; P. 13 ; V. 3 ; C. 11.

Depth (10 mm.) 4·8, head (14) 3·4 in standard length (48). Eye (3·5) a little less than snout (3·7) and 4 in head.

A small tentacle over each eye and another on each side of the nape ; a small flap on each side of the chin.

General coloration, various shades of brown, disposed in markings as shown in the figure. Belly plain. A dusky band across the base of the otherwise hyaline caudal fin.

Two others (IA.4447) from Batt Reef. Identified by comparison with co-types in the Australian Museum. Distinguished from *P. hypselopterus* by the much smaller tentacles, low dorsal spines, longer body, and lighter coloration, with plain belly.

Family BATRACHOIDIDAE.

Genus *Coryzichthys*, Ogilby, 1908.*Coryzichthys diemensis* (Le Sueur).

One specimen (IA.4482) from Low Isles. Eastern Australian forms with the throat mottled may represent a distinct subspecies, *C. diemensis queenslandiae* (De Vis), with *C. guttulatus*, Ogilby, as a synonym.

Family ELEOTRIDAE.

Genus *Calleleotris*, Gill, 1863.Subgenus *Gergobius*, Whitley, 1930.*Calleleotris* (*Gergobius*) *taeniura* (Macleay).

One specimen (IA.4345) from Low Isles, the type-locality.

Calleleotris (*Gergobius*) *muralis* (Cuvier and Valenciennes).

Eleotris muralis, Cuvier and Valenciennes, Hist. Nat. Poiss. XII, March, 1837, p. 253, pl. cccvii; Tukopia, Santa Cruz Archipelago (Quoy and Gaimard).

Eleotris lineata, Castelnau, Vict. Offic. Rec. Philad. Exhib. 1875, p. 24; Cape York, Queensland.

Eleotris nigrifilis, Ogilby, Proc. Linn. Soc. N.S.W. XXI, 31st May, 1897, p. 754. New name for *Eleotris lineata*, Castelnau, regarded as anticipated by *Dormitator lineata*, Gill, 1863; Cape York, Queensland.

Valenciennea aruensis, Ogilby, Proc. Ry. Soc. Qd. XXIII, 7th November, 1910, p. 21; Aru Is.

Valenciennea muralis, McCulloch and Ogilby, Rec. Aust. Mus. XII, 1919, p. 216, pl. xxxvii, fig. 4, and as *V. lineata* on p. 264.

Calleleotris muralis and *lineata*, McCulloch, Mem. Aust. Mus. V, 1929, p. 367.

One (IA.4346) from Low Isles. Under stones, 16th September, 1928.

Eleotris lineata, Castelnau, and *E. nigrifilis*, Ogilby, are obviously synonyms of this species.

Genus *Asterropterix*, Rüppell, 1830-1.*Asterropterix semipunctatus quisqualis*, subsp. n.

The Queensland fish, the type of which has been described and figured by Ogilby (Mem. Qd. Mus. III, 1915, p. 125, pl. xxix, fig. 2), is hereby separated subspecifically from the typical *Asterropterix semipunctatus*, Rüppell, Atlas zu der Reise im N. Afrika (Senckenb. Nat. Ges.), 1830-31, p. 138, pl. xxxiv, fig. 4, from the Red Sea, on account of its fewer dorsal rays, and the lower spinous dorsal and ventral fins.

Six (IA.4347) from Low Isles, where the species is not so common as it is in other places on the Great Barrier Reef.

Genus *Eviota*. Jenkins, 1903.

Eviota viridis queenslandica, subsp. n.

Allogobius viridis, Waite, Rec. Aust. Mus. V, 11th March, 1904, p. 177, pl. xxiii, fig. 3; Lord Howe Is. Types in Aust. Mus., Sydney.

Eviota viridis, McCulloch, Rec. Aust. Mus. IX, May, 1913, p. 386 (Great Barrier Reef locs.); Waite, Trans. Roy. Soc. S. Aust. XL, 1916, p. 454; McCulloch and Ogilby, Rec. Aust. Mus. XII, 1919, p. 260; Whitley, Aust. Zool., IV, 1926, p. 234 (North-West Islet, Qd.) and Rec. Aust. Mus. XVI, 1927, p. 27 (Michaelmas Cay, Qd.); *op. cit.* XVI, 1928, p. 302 (Hoskyn I., Qd.); Fowler, Mem. Bishop. Mus. X, 1928, p. 395.

Compared with typical specimens of *Eviota viridis* from Lord Howe Island, the Queensland form of this species is easily distinguished by its darker general coloration, large spots on head and two dark spots, which may be diffuse, on pectoral base. For this reason I name the Great Barrier Reef subspecies *Eviota viridis queenslandica*, the holotype being a specimen (IA.4068) from Batt Reef. This species is common in coral, and will probably be found to be separable into different subspecies from separate geographical areas. Specimens in the Australian Museum from the New Hebrides resemble the Queensland form in facies, whilst the Samoan *Eviota zomura*, Jordan and Seale (Bull. U.S. Bur. Fish., XXV, 1905 [15th December, 1906], p. 396, fig. 75), is apparently another subspecies. The described species of *Eviota* are evidently closely allied, and have bristle-like branches on the ventral and lower pectoral rays and naked nuchal region. The latter character is the main one for distinguishing *Eviota* from *Trimma*, Jordan and Seale (*loc. cit.*, pp. 381 and 391).

At Low Isles a few specimens of the new subspecies were secured (IA.4093, 4338).

Family Gobiidae.

Genus *Gobius*, Linnaeus, 1758.

Istigobius, subgen. nov.

Genotype *Gobius (Istigobius) stephensoni*, sp. n.

Distinguished from the true Palaearctic genus *Gobius* (type *G. niger*, Linnaeus) by its strongly contrasted colour pattern, larger scales, and longer caudal peduncle.

Gobius (Istigobius) stephensoni, sp. n.

Gobius maculatus, Castelnau, Vict. Offic. Rec. Philad. Exhib. 1875, p. 20; Queensland. Name preoccupied by *G. maculatus*, Nardo, Isis, XX, 6th June, 1827, p. 475.

Gobius ornatus, McCulloch and Ogilby, Rec. Aust. Mus. XII, 1919, p. 227, pl. xxxiii, fig. 2. Murray Island specimen is type of *G. stephensoni*. Not *G. ornatus*, Rüppell, 1830-1; Whitley, Rec. Aust. Mus. XVI, 1927, p. 28 (Michaelmas Cay, etc.), and of Australian authors.

The Queensland form of *Gobius ornatus*, Rüppell, was named *Gobius maculatus* by Castelnau, but this name was preoccupied by *G. maculatus*, Nardo, and may now be

replaced by *Gobius stephensoni*, named in honour of Dr. T. A. Stephenson of London University. This species is allied to the North-West Australian *Gobius interstinctus*, Richardson (Zool. Voy. "Erebus" and "Terror," Fish, 1844, p. 3, pl. v, figs. 3-6), but differs from Richardson's description and figure in having free upper pectoral rays, and ground-colour lighter in tone. The holotype of *Gobius stephensoni* is the specimen from Murray Island described and figured by McCulloch and Ogilby.

Fourteen (IA.4350) from Low Isles, where the species was common. Others seen at Snapper Island.

Genus *Bathygobius*, Bleeker, 1878.

Bathygobius fuscus darnleyensis (Alleyne and Macleay).

? *Gobius fuscus*, Rüppell, Atlas zu der Reise im N. Afrika (Senckenb. Nat. Ges.), Fische, 1830-31, p. 137; Red Sea.

Gobius darnleyensis, Alleyne and Macleay, Proc. Linn. Soc. N.S.W. I, March, 1877, p. 331, pl. xii, fig. 1; Darnley I., Queensland.

Gobius nigripinnis, Alleyne and Macleay, Proc. Linn. Soc. N.S.W. I, March, 1877, p. 332, pl. xii, fig. 2; Palm Island, Queensland. Preoccupied by *G. nigripinnis*, Cuvier and Valenciennes, Hist. Nat. Poiss. XIII, 1837, p. 101.

Gobius marginalis, De Vis, Proc. Linn. Soc. N.S.W. IX, 29th November, 1884, p. 686; Cape York, Queensland.

Mapo fuscus, McCulloch and Ogilby, Rec. Aust. Mus. XII, 1919, p. 231, pl. xxxiii, fig. 3; Darnley I., Torres Strait.

Four small specimens (IA.4430) and one larger one (IA.4431) from Low Isles.

Gobius nigripinnis, Alleyne and Macleay, is preoccupied, but *G. darnleyensis*, of the same authors, has page-priority, and is available for the Queensland form of *Bathygobius fuscus*.

Genus *Metagobius*, Whitley, 1930.

In this genus the ventral fins are only united by a small basal membrane and the scales are larger and the body shorter than in *Callogobius*, Bleeker.

Metagobius sclateri (Steindachner).

One from Low Isles (IA.4348) swimming with the ventral fins separated. The original description of this species is not available to me but, on zoogeographical grounds, it seems reasonable to suppose that the North Queensland form may not be identical with the typical Tahitian one; in which case a new name would have to be proposed for the Australian species.

Genus *Amblygobius*, Bleeker, 1874.

Amblygobius phalaena (Cuvier and Valenciennes).

A female in roe (IA.4349) from Low Isles.

Yongeichthys, gen. nov.

Genotype, *Gobius criniger*, Cuvier and Valenciennes.

Body robust, compressed, covered with large ctenoid scales, which become cycloid on the breast and the base of the pectoral. Head entirely naked, with lines of mucigerous pores crossing the cheeks and opercles, and large open pores above the nostrils, on the interorbital space, along the nuchal groove, and around the preopercular margin. Snout obtuse, the profile convex. Jaws subequal. Mouth a little oblique: no barbels. A band of villiform teeth in each jaw, and an outer series of enlarged ones; a subcaniniform tooth may be present on each side of the mandible. Tongue subtruncate, free anteriorly. Gill-openings lateral, the isthmus broad. Exposed edge of shoulder-girdle smooth. Pseudobranchiae present. Gill-rakers short, thick, about five on lower limb of first branchial arch. Dorsal with six spines and about ten rays. Anal similar to soft dorsal. Pectoral rounded, its upper rays not free. Ventrals large, united, with a broad basal membrane. Caudal rounded.

Equivalent to *Rhinogobius*, McCulloch and Ogilby, 1919, *non* Gill, 1859.

The genotype of *Rhinogobius*, Gill, 1859, is the Japanese *R. similis*, which has a larger mouth and higher dorsal than the Queensland species. *Fusigobius*, Whitley, 1930, has a more pointed head and different fin-outlines. The genus *Ctenogobius*, Gill, 1858, is West Indian and need not be considered here; *Coryphopterus*, Gill, 1863, is also a New World genus. The filiform dorsal spine and the large lateral blotches of *Gobius criniger* apparently distinguish it from *Porogobius*, Bleeker, 1874, and the colours and formulae of *Gobius schlegelii*, Günther, from the Gold Coast, the genotype of *Acentrogobius*, Bleeker, 1874, show that none of the genera associated with the "*Rhinogobius*" of Australian authors can be used for this species. It is therefore necessary to erect a new genus with *Gobius criniger*, Cuvier and Valenciennes, as type.

Named in honour of Dr. C. M. Yonge, leader of the Great Barrier Reef Expedition.

Yongeichthys criniger (Cuvier and Valenciennes).

Gobius criniger, Cuvier and Valenciennes, Hist. Nat. Poiss. XII, March, 1837, p. 82; Port Dorey, New Guinea (Quoy and Gaimard).

Gobius festivus, De Vis, Proc. Linn. Soc. N.S.W. IX, 29th November, 1884, p. 687; Cape York, Queensland (Broadbent).

Rhinogobius nebulosus, McCulloch and Ogilby, Rec. Aust. Mus. XII, 1919, p. 245; not *Gobius nebulosus*, Forskål, Descr. Anim. 1775, p. 24, from the Red Sea.

The Queensland fish called *Rhinogobius nebulosus* by Jordan and Seale, McCulloch and Ogilby, and Australian authors, would more appropriately assume the specific name of *Gobius criniger* supplied by Cuvier and Valenciennes, as its fin-counts differ from those of *Gobius nebulosus*, Forskål.

A specimen of *Yongeichthys criniger* (IA.4351) was found in a shallow pool amongst mangroves, 10th September, 1928. Others were seen entering burrows in the mud which had been made by crustaceans. One fish might enter several burrows in succession. It would protrude its head from a hole and wait and watch for several minutes, then, flicking a puff of sand, would swim away.

Yongeichthys leftwichi (Ogilby).

Rhinogobius leftwichi, Ogilby, Proc. Roy. Soc. Qd. XXIII, 7th November, 1910, p. 24; Great Sandy Strait, Queensland; McCulloch and Ogilby, Rec. Aust. Mus. XII, 1919, p. 248, pl. xxxiv, fig. 3 (topotype).

One (IA.4354), near mangroves, Low Isles, 29th August, 1928.

Genus *Priolepis*, Cuvier and Valenciennes, 1837.

Priolepis, Cuvier and Valenciennes, Hist. Nat. Poiss. XII, March, 1837, p. 67. Ex Ehrenberg MS. Genotype, *P. mica* (Ehr.) Cuvier and Valenciennes, a Red Sea variety of the Pacific *Gobius semidoliatus*, Cuvier and Valenciennes.

Zonogobius, Bleeker, Arch. Néerland Sci., IX, 1874, p. 323. Genotype, *Gobius semifasciatus*, Kner (fide Jordan, Gen. Fish. III, 1919, p. 374).

Priolepis, Cuvier and Valenciennes, should replace *Zonogobius*, Bleeker. In his Genera of Fishes, Jordan (p. 373) remarked that Bleeker, in his Esquisse (1874), which is not available to me, made *Priolepis* equivalent to *Asterropteryx*, Rüppell, but Cuvier and Valenciennes' brief account suggests that *Priolepis* is distinct, as the characteristic bands are mentioned and these are not present in *Asterropteryx*. Hemprich and Ehrenberg figured *Priolepis micans* in their Symbolae Physicae, which I have not seen, and Boulenger (Zool. Rec., 1899 [1900], p. 24) notes the identity of this species with *Gobius semidoliatus*, Cuvier and Valenciennes.

Priolepis nuchifasciatus (Günther).

Three specimens (IA.4355) from Low Isles. Very sluggish, and may be caught by hand.

Beetroot-red in life as in Herre's figure of *Z. semidoliatus* (Monog. Philipp. Bur. Sci. XXIII, 1927, pl. xxx, fig. 2), but this colour fades away after death. McCulloch, in manuscript, noted the life-colours of Masthead Island specimens as "scarlet, brightest on the head, which is marked with thin bluish-white, dark-edged lines. Scales dark-edged. Dorsals, caudal, and anal with several rows of scarlet spots." The late Dr. W. E. J. Paradise noted the colours of Cumberland Islands specimens (IA.2377) as follows:

"Locality: Cumberland Is., Great Barrier Reef. Blown up in three fathoms near rocks. At a distance the small fish appears reddish brown all over, but considerably lighter in the pectoral region than elsewhere. On close examination it is seen that each scale has an almost colourless centre and is outlined with reddish brown. The head is reddish brown with the brown predominating whilst in the tail the red predominates, the transition of colour being gradual and uniform. No outlines of scales can be detected by the naked eye anterior to the origin of the dorsal fin, and the head is marked by several white transverse bands, the edges of which are clearly defined by a line of brown slightly darker than the ground-colour of the head. The unpaired fins (including tail) have zig-zag lines of reddish brown crossing a colourless ground. The pectorals are almost colourless and the ventrals brown with a white edge."

Subfamily *Gobiodontinae*.Genus *Gobiodon*, Bleeker, 1856.*Gobiodon unicolor* (Castelnau).

Ellyria unicolor, Castelnau, Proc. Zool. Acclim. Soc. Vict. II, 10th May, 1873, p. 95; Eclipse I., Cape Sidmouth, Queensland.

Ellyria (sic), Castelnau, Offic. Rec. Philad. Exhib. Melb. 1875, p. 21.

Gobiodon verticalis, Alleyne and Macleay, Proc. Linn. Soc. N.S.W. I, March, 1877, p. 333, pl. xii, fig. 4. No locality (= Darnley I., Qd.). Types in Macleay Museum, University of Sydney; McCulloch and Ogilby, Rec. Aust. Mus. XII, 1919, p. 208, pl. xxxii, fig. 2 (Green I., Qd.); Whitley, Rec. Aust. Mus. XVI, 1927, p. 28 (Michaelmas Cay, Qd.).
Gobius douglasi, Saville-Kent, Gt. Barrier Reef, 1893, p. 310, chromo-pl. xvi, fig. 12; Thursday I., Qd.

Two specimens (IA.4066) from Batt Reef agree with Castelnau's description; his name has precedence over *G. verticalis*, Alleyne and Macleay. The types of the latter came from Darnley Island, not New Guinea as stated by authors. This species is common amongst coral on the Great Barrier Reef.

Genus *Paragobiodon*, Bleeker, 1873.

Paragobiodon echinocephalus gibbosus (Macleay).

Gobius echinocephalus, Rüppell, Atlas zu der Reise im N. Afrika (Senckenb. Nat. Ges.) Fische, 1830 *vel* 1831, p. 136, pl. xxxiv, fig. 3 (*ex* Ehrenberg MS.); Massowah, Red Sea.
Gobius gibbosus, Macleay, Proc. Linn. Soc. N.S.W. V, 20th May, 1881, p. 601; Endeavour R., Queensland. Type in Macleay Museum, University of Sydney.
Gobius scabriceps, Macleay, Proc. Linn. Soc. N.S.W. V, 10th May, 1881, p. 603; Endeavour R., Queensland. Type in Macleay Museum, University of Sydney.
Paragobiodon echinocephalus, McCulloch and Ogilby, Rec. Aust. Mus. XII, 1919, p. 239, pl. xxxiv, fig. 1 (references and synonymy); Whitley, Aust. Zool. IV, 1926, p. 205, and Rec. Aust. Mus. XVI, 1927, p. 28; Herre, Monog. Philipp. Bur. Sci. XXIII, 1927, p. 172, pl. xiii, fig. 2 (Philippines); Whitley, Rec. Aust. Mus. XVI, 1928, p. 301; Fowler, Mem. Bishop, Mus. X, 1928, p. 399.

A common species amongst coral, and very variable in colour. In several parts of Queensland I have noted its preference for *Seriatopora hystrix*, and observed this also at Batt Reef.

Five (IA.4067 and IA.4462) from Batt Reef.

Family PERIOPHTHALMIDAE.

Genus *Euchoristopus*, Gill, 1863.

Euchoristopus kalolo (Lesson).

A few specimens (IA.4352-4343) of this common mangrove fish were preserved for identification. I am using Lesson's specific name, which has priority over that of Cuvier and Valenciennes.

On 27th May, 1770, this species was observed by members of the crew of the "Endeavour" in what is now Queensland (Hawkesworth, Account Voy. S. Hemisph., ed. 1, 1773, III, p. 529), and no visitor to the tropical mangrove swamps can fail to be impressed by this interesting fish.

Family SCORPAENIDAE.

Subfamily *Scorpaeninae*.Genus *Sebastapistes*, Streets, 1877.*Sebastapistes bynoensis laotale*, Jordan and Seale.

Sebastapistes laotale, Jordan and Seale, Bull. U.S. Bur. Fish, XXV, 15th December, 1906, p. 376, fig. 72 ; Apia, Samoa.

Sebastapistes bynonesis, Whitley, Rec. Aust. Mus. XVI, 1927, p. 29 ; Michaelmas Cay, Qd.

Two specimens (IA.4435-4436) from Low Isles ; caught by Mr. F. W. Moorhouse, 29th September, 1928.

Subfamily *Pteroinae*.Genus *Brachirus*, Swainson, 1839.

Brachirus, Swainson, Nat. Hist. Fish. Amphib. Rept. II, July, 1839, p. 71 = *Brachyrus*, Swainson, *ibid.*, p. 264. Genotype, *B. zebra* (Cuvier and Valenciennes) (= *Pterois zebra*, Quoy and Gaimard), selected by Swain, Proc. Acad. Nat. Sci. Philad. 1882 (1883). p. 277. Not *Brachirus*, Swainson, *ibid.*, pp. 187 and 303, a genus of Soles.

Dendrochirus, Swainson, Nat. Hist. Classif. Fish. Amphib. Rept. II, July, 1839, p. 180, *Genus caelebs*. Genotype, *Pterois zebra*, Cuvier and Valenciennes (= Quoy and Gaimard), designated by Jordan and Evermann, Bull. U.S. Fish. Comm. XXIII, 1903 (1905), p. 465.

As *Brachirus* is apparently not preoccupied or otherwise invalidated, it must take precedence over *Dendrochirus*.

Brachirus zebra (Quoy and Gaimard).

One small specimen (IA.4434) was caught at Low Isles 1st September, 1928.

Genus *Pterois*, Schinz, 1822.*Pterois volitans* (Linné).

Noted from Low Isles by Yonge (A Year on the Great Barrier Reef, 1930, p. 96), but not seen from that locality by the writer.

Family SYNANCEJIDAE.

Genus *Synanceja*, Bloch and Schneider, 1801.*Synanceja trachynis*, Richardson.

(Plate IV, figs. 1, 2).

For the taxonomy, synonymy, and bibliography of this species, see my Ichthyological Miscellanea (Mem. Qd. Mus. X, 1930, p. 25). Probably the "*Batrachus*" of MacGillivray (Narr. Voy. "Rattlesnake," I, 1852, p. 198) is referable to this species.

D. xiii/7 ; A. iii (rudimentary)/6 ; P. 16 ; V. i/5 ; C. 9 main branched rays.

Head, measured from symphysis of upper jaw to opercular flap (95 mm.), 2.2 in standard length (209). Depth, at origin of dorsal (90), 1.2 in width at opercles (109). Eye (9) 2.6 in width of supraorbital bosses (24). Ventral fin (50) nearly equal to pectoral base (52). Depth of caudal peduncle (22) 1.5 in length of caudal (34).

Head about as broad as long, but longer than deep. A shield-shaped nuchal bony process with two smaller similar approximate crests adjoining a diamond-shaped depression on each side of the nape. A deep saddle-shaped concavity between dorsal fin and eyes, over each of which there is an excrescence where the frontal bones form a supraorbital boss. A deep concavity above and between the eyes. Upper surface of snout subhorizontal. Below each eye, over the cheek, there is a deep hemispherical depression. Preopercular stay produced into a large bony knob below each eye. A series of bony ridges along each preorbital which ends in two sharp processes, the anterior of which is covered by a fleshy lobe.

Preopercular margin rounded, with five or six lobes and a large flesh-covered spine. Opercular margin oblique, lobed, with a blunt flap superiorly and a projecting rounded bony inferior process.

Gill-openings wide, separated by a broad isthmus. Branchiostegal membranes covered with fatty tissue. Four gill-arches ; no slit behind the fourth. A series of close-set rudimentary gill-rakers like papillae.

Cleft of mouth almost vertical, gape wide. Premaxillary arc-shaped, its width subequal throughout its length. Maxillary with a broad truncate margin and the angles rounded. A concavity on each side between chin and mandible. A band of small, close-set, pointed teeth in each jaw, separated by a fleshy process at each symphysis. A velar flap in both jaws. An inconspicuous patch of teeth on the vomer but none on palatines. A large oval patch of teeth, on each side, above and below, before the pharynx ; the lower patches are in advance of the upper, and bear smaller teeth. Tongue broad and fleshy, with a rounded margin. Head covered with a thick skin, without scales. The skin is produced into finbrae around the mouth, and gives rise to wart-like protuberances on opercles and chin.

Body rounded anteriorly, compressed posteriorly, and with a bag-like belly. The skin is thick, wrinkled and with large wart-like processes, which are largest on the back and sides, and not nearly so plentiful under the pectoral. The thick skin extends over the fins and almost obliterates many of the rays. There is a row of warts along each side of the dorsal and one wart on each side of the root of the tail ; other warts occur on the upper surface of the pectorals.

Dorsal originating vertically over preopercular spine. The first three spines are long, spaced, and slightly distinct from the remaining ten. Each spine is sharp and provided with a venom-sac on each side, but all but the tip of each spine is concealed by thick skin which is noticeably lobed on the anterior spines. Second dorsal short, but with the median rays longer than any of the spines. The last dorsal ray is connected to the caudal peduncle by a thick membrane which is just distinct from the caudal. Anal with three rudimentary spines like fleshy fingers ; soft portion of fin similar to soft dorsal, and connected to the caudal peduncle in the same way, but more anteriorly. Pectorals broad and muscular, with the skin of the under-surface smooth. The nine lowest rays are thick and like curved fingers, but the uppermost rays are branched and almost hidden

by the thick integument. Ventrals stumpy, with a long base; the rudimentary spine and first two or three rays are finger-like, and a broad membrane connected the fifth ray of each ventral fin to the belly. There are hardly any warts on or between the ventral fins. Caudal broad, regularly fan-shaped, with a rounded margin.

The general colour in formalin is rusty brownish, marbled with grey, which becomes the predominating colour on the top of the head and back, and on the larger warts. The greyish marbling tends to form bars or reticulations on the fins, which are of a darker brown towards their margin. There is a sea-green tinge suffusing the grey marbling on the bony prominences of the head and on the light ground-colour of the cheeks. A dark brown diamond-shaped concavity on the nape bears a superficial resemblance to an eye, as does also a brown patch in the hemispherical concavity below the true eye. Snout, jaws, and velar flaps in mouth spotted with brown. Interior of mouth white; bands of teeth yellowish.

Described and figured from a Stonefish nearly 10 in. long. Australian Museum registered number IA.4057.

This specimen has already figured in popular articles on the Great Barrier Reef Expedition*; it was collected on the reef near the mangroves at Low Isles under the following circumstances which are described in my field notes:—

24th September, 1928: I was about to turn over a piece of coral when something between it and a gaping clam attracted my attention. This object was so like a piece of eroded rock that I had to examine it closely before realizing that it was in reality a stonefish. I touched it with a stick and the three anterior dorsal spines were erected immediately. The fish was absolutely still and its misshapen head, of a lemon-yellow colour in life, was pockmarked with grey, which heightened its resemblance to the yellowish madrepores from which its head and foreparts were protruding. The dorsal spines were yellowish, with their investing integument puckered into fronds and frills. The eyes had tiny black pupils surrounded by a variegated iris whose surface appeared pimpled. The hinder parts of the body and the thick pectorals were partly hidden, but appeared yellowish with reddish wart-like processes. The mouth was kept tightly shut, but I pushed it open with a piece of coral and noted the inside as white with blackish markings. Only the upper part of the gill-slit appeared to be opened and closed and that almost imperceptibly, a small current of water being ejected at intervals of about four seconds. The edge of the gill-slit was finely fimbriated so as to look as if fringed with algae. A photograph of this Stonefish, taken *in situ* by Mr. W. Boardman, is reproduced here.

Molluscs crawled over the stonefish's rock-like head and some prawns even walked over its mouth but the stonefish paid no attention to them. The head, body and fins were covered, as is usual in this species, with a thick coating of brown or greenish-brown slime. The specimen was netted and kept alive for some hours in a bucket of water, but it died overnight.

The colours of a specimen from Thursday Island (Austr. Mus. regd. no. IA.2046), sent to Sydney in ice, were noted as follows:

The dominant colours of this specimen are scarlet and grey which form an anastomosing pattern. The greater part of the head and back is grey, closely speckled with more or

* Tandy, Nat. Hist. Mag., London, II, 1929, p. 89, fig. 11; Whitley and Boardman, Aust. Mus. Mag. III, 1929, p. 369, with frontispiece and photo in text; Yonge, A Year on the Great Barrier Reef, 1930, p. 94, pl. xxix, fig. c. All these articles deal with the identical specimen.

less rounded spots, defined by darker lines around their edges. On the head the spots are largely brown above and red below, but on the back they are dark red anteriorly, changing to scarlet posteriorly. The sides of the body are principally scarlet, this colour being broken up by a grey, dark-edged, reticulating pattern. These colours become lighter below and change gradually into white on the belly. The sub-ocular cavity has a large black central spot, surrounded by others of lighter tint and separated by whitish lines; the whole bears some resemblance to a large eye. The cavity on each side of the occiput is black; another black blotch covers the base of the upper opercular spine, and less definite darker areas occur on the maxillary bone and between the preopercular spines. The dorsal fin is grey, with scarlet spots like the back, and a darker margin; the soft dorsal has a broad dark margin and is crossed obliquely by an irregular whitish streak. The anal fin is lighter basally, but is somewhat similar to the soft dorsal. Pectoral largely scarlet, with a dark purplish margin, and the whole fin is covered with numerous irregular whitish sub-reticulate lines. Caudal scarlet at base, changing to dark-purplish towards the margin, and is crossed by numerous white or grey lines with darker edges, of which a broad one across the middle of the fin is most conspicuous. Ventral yellowish basally, the rays scarlet, and the membrane between their tips dark purple; a series of broad white dark-edged spots crosses the rays about the middle of the fin, and there are several light circular spots. Gill membranes white. Chin and throat with grey and scarlet markings similar to the rest of the head. Inside of mouth pure white, but tinged with green on the inner surface of the lips.

Total length, 305 mm.

Genus *Synanceichthys*, Bleeker, 1863.

- "*Spurco*," Cuvier and Valenciennes, Hist. Nat. Poiss. IV, November, 1829, p. 452; *ex* Commerson MS., non-binomial. One species (*Scorpaena brachion*, Lacepède, = *Synanceichthys verrucosus*).
Synanceichthys, Bleeker, Ned. Tijdschr. Dierk. I, 1863, p. 234. Type, *Synanceja verrucosa*, Bloch and Schneider (*vide* Jordan, Classif. Fish. 1923, p. 210).
Emmydrichthys, Jordan, Proc. Calif. Acad. Sci. (2), VI, 1st March, 1897, p. 221; *ex* Jordan and Rutter MS. Genotype, *E. vulcanus*, Jordan.
Deleastes, Seale, Occ. Pap. Bishop. Mus. IV, 1, 1906, p. 80. Genotype *D. daector*, Seale. Not *Deleaster*, Erichson, 1839, a genus of Coleoptera. Said to have "smaller ventrals, situated more posteriorly than in *Synanceia*, . . . skin smooth."
Synanceja, Jordan, Gen. Fish. III, 1920, p. 374. Type wrongly regarded as *S. verrucosus*. Not *Synanceja*, Bloch and Schneider, *sensu stricto*.

I follow Jordan in using *Synanceichthys* for this genus as I am unable to consult Bleeker's original definition (Ned. Tijdschr. Dierk. I, 1863, p. 234).

Synanceichthys verrucosus (Bloch and Schneider).

Mr. F. W. Moorhouse collected a Stonefish on Batt Reef which I identified as *Synanceichthys verrucosus*. It had the interorbital broad, deeply concave. Mouth broad. No prominent processes on preoperculum. Base of pectoral longer, head broader and caudal smaller than in the *Synanceja trachynis* from Low Isles. Chin broad. Ventrals reaching well towards anal. Pharyngeal teeth in large patches.

This Stonefish is apparently not nearly so common on the Great Barrier Reef as *Synanceja trachynis*.

Specimens are in the Australian Museum from—

Murray I., Queensland,
Suva, Fiji,
Malay Archipelago (Day Coll.), and
Bougainville I., Solomon Group.

Family PLATYCEPHALIDAE.

Subfamily *Inegociinae*.

Genus *Suggrundus*, Whitley, 1930.

Subgenus *Repotrudis*, Whitley, 1930.

Suggrundus (Repotrudis) macracanthus (Bleeker).

One specimen (IA.4344) dredged in 12 fathoms, off Low Isles, 16th, October, 1928, by Mr. A. A. Livingstone.

Family BALISTIDAE.

Genus *Balistapus*, Tilesius, 1820.

Subgenus *Rhinecanthus*, Swainson, 1839.

Balistapus (Rhinecanthus) aculeatus (Linnaeus).

Specimens (IA.1622) from Low Isles were collected by Dr. W. E. J. Paradise as well as by members of the Expedition (IA.4053, 4089, 4499). These agree in detail with the description of *Balistes aculeatus* by Linnaeus (Syst. Nat., ed. 10, 1758, p. 328). Other specimens are in the Australian Museum from Two Isles and Masthead Islet, Queensland; Port Moresby, Papua; Vanikoro, Santa Cruz Group; Vate and Aneiteum, New Hebrides; Samoa; Fiji; Bougainville Island, Solomons. This species is common in the coral waters of the Pacific.

Family OSTRACIIDAE.

Genus *Lactoria*, Jordan and Fowler, 1902.

Lactoria cornutus (Linnaeus).

One (IA.4500) caught whilst it was swimming around a block of *Porites* coral on Batt Reef, 13th September, 1928.

Family TETRAODONTIDAE.

Genus *Ovoïdes*, Anonymous, 1798.

"*Les Ovoïdes*," Lacepède, Hist. Nat. Poiss. I, 1798, p. 520. Haplotype, "*Ovoïde fascé*" from "*La mer des Indes*." Vernacular name only.

Crayracion, Walbaum, Artedi, Ichthyol. (3), ed. 2, 1792, p. 580; *ex* Klein, non-binomial. Name not acceptable.

Ovoïdes, Anonymous, Allg. Lit. Ztg. (Jena), No. 287, 1798, p. 674 (*fide* Jordan, Classif. Fish, 1923, p. 240).

Genotype, *Orum commersoni*, Bloch and Schneider, by present designation.

Ovoïdes, Cuvier, Leçons Anat. Comp. I. 1800, Table IV, *nomen nudum*.

Orum, Bloch and Schneider, Syst. Ichth., 1801, p. 530. Genotype, *O. commersoni*, Bloch and Schneider, based on "L'Ovoïde fascé" of Lacepède. Not *Orum*, Martini, 1774, a non-binomial genus of mollusca (*teste* Mr. T. Iredale).

Oonidus, Rafinesque, Analyse de la Nature, 1815, p. 90. *Fide* Sherborn, Index Anim.

Ooides, Agassiz, Nomencl. Zool. 1846, Index Univ. Emend. pro. "Ovoïdes" Lacepède.

Crayracion, Bleeker, Atlas Ichth. VI, 1872, p. 49. Revival of a non-binomial name proposed by Klein, 1777. Genotype, *C. loevissimus*, Bleeker, based on Klein.

Tetraodon, Linnaeus (Syst. Nat., ed. 10, 1758, p. 332, genus 165. Genotype, *T. lineatus*, Linnaeus [spelt "*Tetrodon*" by Linnaeus, 1766] from the Nile), has recently been restricted to fluviatile species. *Ovoïdes* is here used for the Indo-Pacific Puffer-fishes of the *stellatus* and *aerostaticus* group with the body spotted, and the distensible belly with dark stripes (at least in the young).

Ovoïdes aerostaticus otteri, var. n.

(Plate III, fig. 2.)

Tetraodon aerostaticus, Jenyns, Voy. "Beagle," Fish, 1842, p. 152. Locality unknown. Said to have no lateral line; Jordan and Seale, Bull. U.S. Bur. Fish, XXV, 1906, p. 368.

Crayracion lineatus, Bleeker, Atlas Ichth. V, 1872, p. 70, pl. ccvi, fig. 1, and pl. ccxii, fig. 1 (plates published 1865); East Indies. Not *Tetrodon lineatus*, Linnaeus, 1758, from the Nile.

Tetraodon stellatus, Günther, J. Mus. Godeffroy, VI, 17 (Fische de Südsee, IX), 1910, p. 465, pl. clxvi, fig. B. Gesellschafts Ins. Not *T. stellatus*, Bloch and Schneider, 1801, from Mauritius.

One (IA.4494), 101 mm. in standard length, from Batt Reef, agrees in general features with Bleeker's figure on pl. ccvi, and differs from Jenyns' description in having a well-marked lateral line system. *Tetrodon amabilis*, Castelnau (Proc. Linn. Soc. N.S.W., III, 1879, p. 401), is a distinct species from New South Wales characterized by its orange ground-colour. In *Tetraodon calamara*, Rüppell (Atlas zu der Reise im N. Afrika [Senckenb. Nat. Ges.], Fische, 1829, p. 64, pl. xvii, fig. 1; Red Sea), the eye is about 3 in snout whereas it is only about 2 in the Batt Reef specimen. As the Queensland form is evidently unnamed, I have much pleasure in associating the name of Mr. Guy Otter, one of the Zoologists of the Expedition, with this novelty.

COLOURS WHEN FRESH.—Back dark brown, lighter on sides and becoming whiter on the belly, which is tinged with yellow ochre ventrally. Head, back, sides and tail densely sprinkled with blackish spots, which are smallest on the back and largest on the tail. The belly is streaked with broad irregular black markings. Gill-opening bluish black and each pectoral fin surrounded by a black ring. Pupil bluish, iris coppery. Dorsal and anal fin-rays smoky yellowish. Some parts of sides darker than others. Vent surrounded by a black spot. Lips greyish.

Ovoïdes implutus (Jenyns).

? *Tetraodon hispidus*, Linnaeus, Syst. Nat. ed. 10, 1758, p. 333. Based on Chin. Lagerstr. 23 and Artedi, gen. 58, syn. 83; India.

Tetrodon implutus, Jenyns, Zool. Voy. "Beagle," Fish, 1842, p. 152; Keeling Islands.

Crayracion laterna, Bleeker, Atlas Ichthy. VI, 1865, pl. ccv, fig. 3; *ibid.*, 1872, p. 71, as *C. implutus*.

Tetraodon hispidus, McCulloch, Mem. Aust. Mus. V, 1929, p. 428, and of Australian authors generally.

Tetraodon, Yonge, A Year on the Great Barrier Reef, 1930, p. 88, pl. xxix, fig. A (Low Isles, Qd.).

Great Barrier Reef specimens in the Australian and Queensland Museums have no arc-shaped markings around eyes and have the cheeks and chin with light spots on a dusky ground, agreeing with Bleeker's figure, but not with any in Day's Fishes of India.

Two specimens (IA.4492, 4493) from Low Isles. This species can move either eye independently of the other ; it does not unfold the caudal fin very much when swimming, thereby resembling the Aluterid fishes.

Ovoides manillensis (Procé).

Tetrodon manillensis, Procé, Bull. Soc. Philom., Paris, September, 1822, p. 130 ; Manila, Philippine Is.

Tetraodon immaculatus, Jordan and Seale, Bull. U.S. Bur. Fish. XXV, 1906, p. 370 (references). Not

T. immaculatus, Bloch and Schneider, 1801.

Three (IA.4495, 4496 and 4497) from Low Isles, where the species was common. Body striped and with prickles capable of penetrating the hand in contrast to the almost smooth integument of *O. implutus*. Future study, with more specimens, may show that the two species should be subgenerically separated.

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DESCRIPTION OF PLATE I.

FIG. 1.—*Himantura granulata* (Macleay). A living specimen among mangrove roots at Low Isles. Australian Museum registered number IA.4477. Photograph by William Boardman.

FIG. 2.—*Actinicola percula* (Lacepède). A specimen swimming amongst the tentacles of a large sea-anemone (*Stoichactis*). The arrows in the margin point towards the fish. Photograph by William Boardman.



FIG. 1.

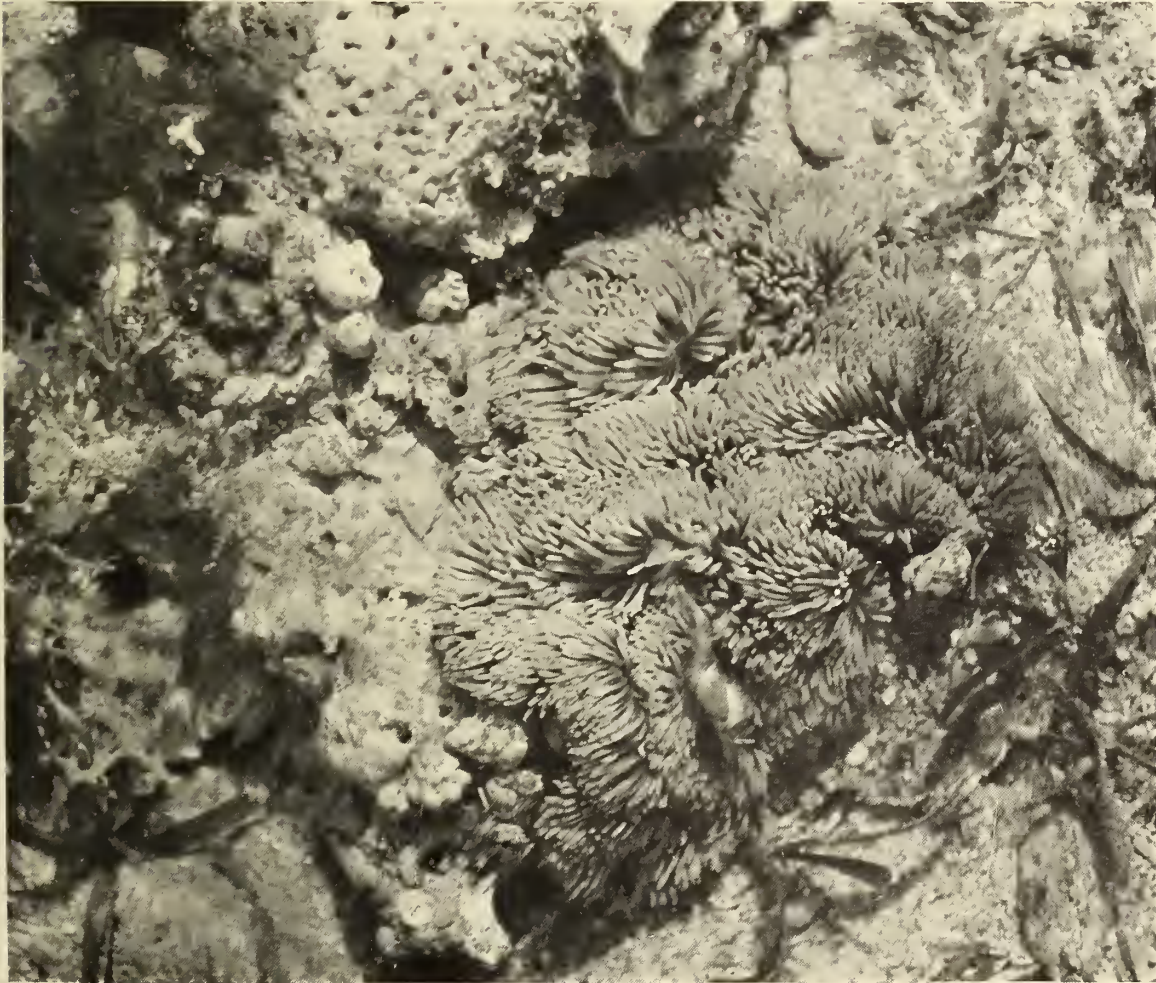
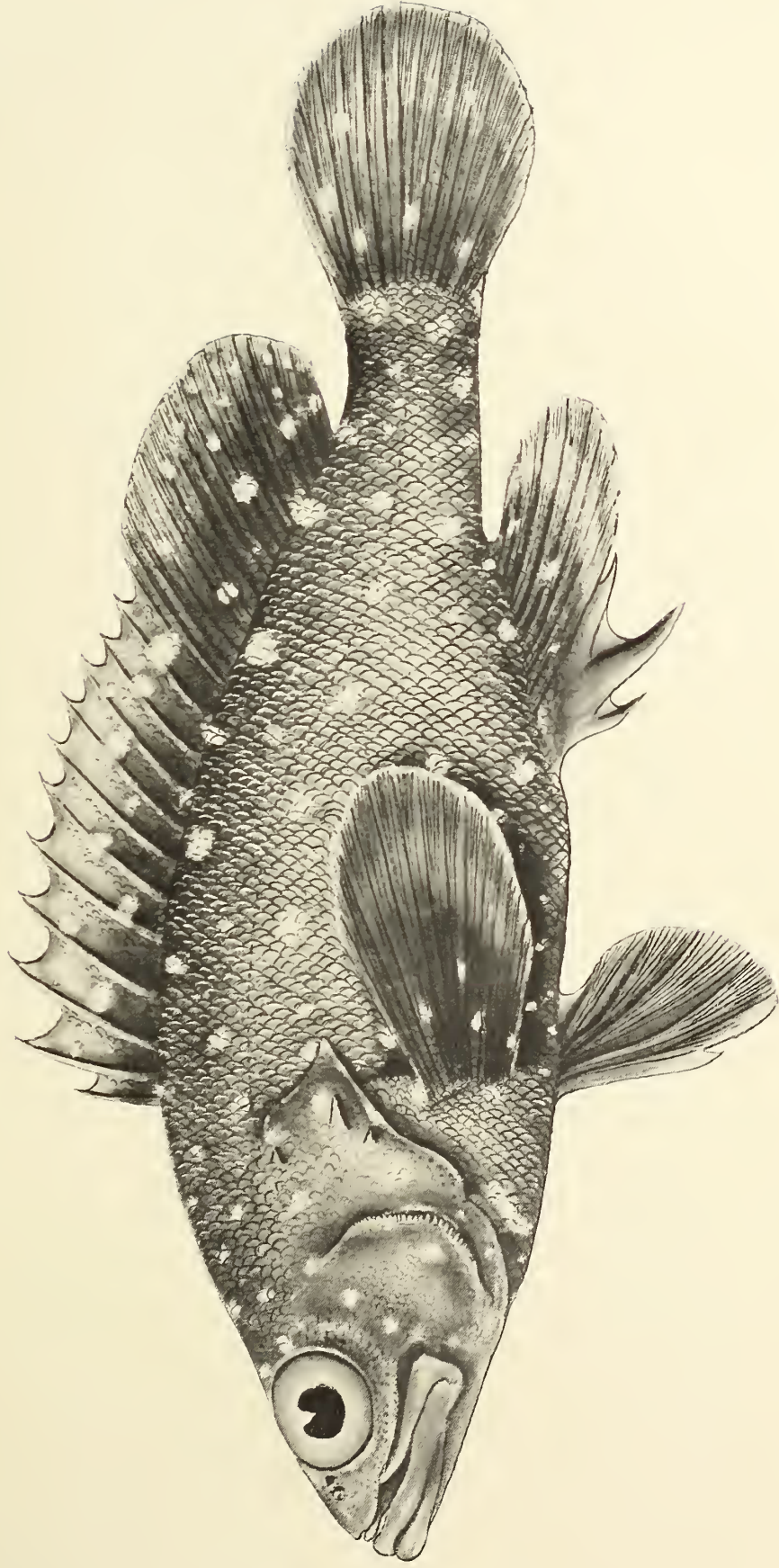


FIG. 2.

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DESCRIPTION OF PLATE II.

FIG. 1.—*Epinephelus hoevenii* (Bleeker). A specimen from Low Isles. Regd. no. IA.4426. Drawing by Miss Joyce K. Allan.



DESCRIPTION OF PLATE III.

FIG. 1.—*Equula obscura* (Seale). A specimen from Low Isles. Regd. no. L
K. Allan.

FIG. 2.—*Ovoides aerostaticus otteri*, var. n. Holotype of variety from Batt
Drawing by Joyce K. Allan.

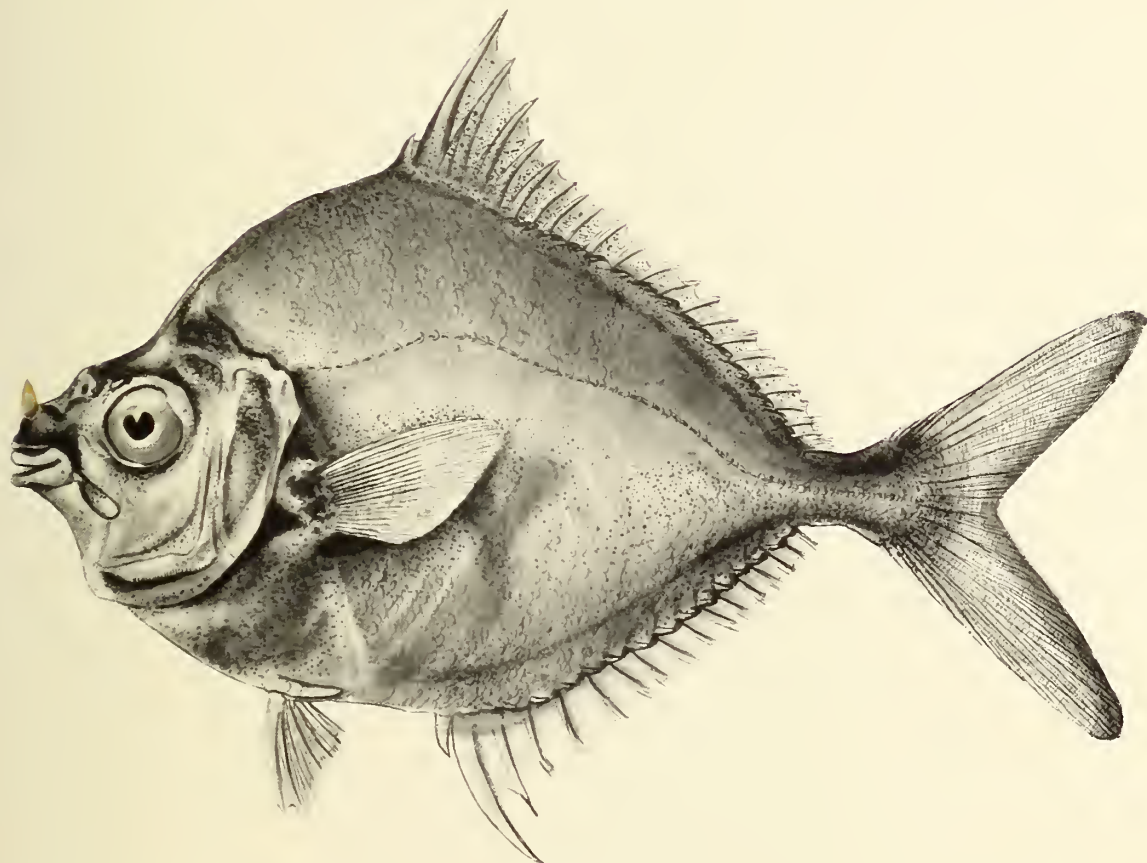


FIG. 1.

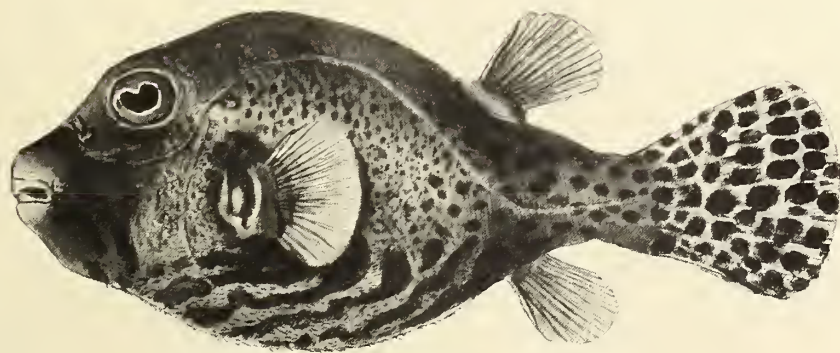


FIG. 2.

DESCRIPTION OF PLATE IV.

FIG. 1.—*Synanceja trachynis*, Richardson. Living specimen *in situ* amongst corals, a horseshoe clam, and other objects, showing its remarkable resemblance to its surroundings, in the moat at Low Isles. The arrows in the margin point towards the fish. Photograph by William Boardman.

FIG. 2.—*Synanceja trachynis*, Richardson. The same specimen as in fig. 1 removed from its natural surroundings. Low Isles. Regd. no. IA.4057. Photograph by William Boardman.



FIG. 1.

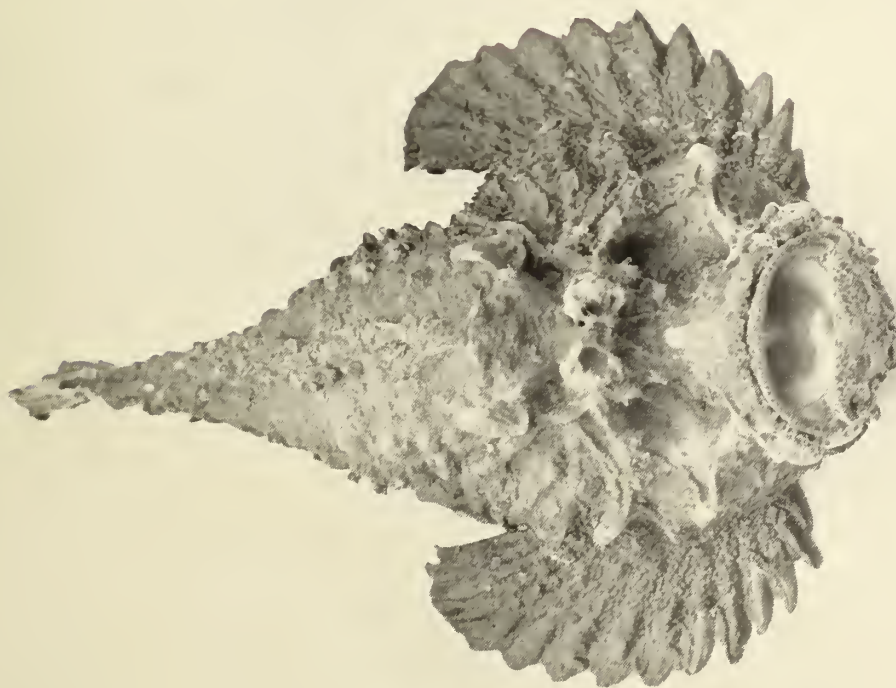


FIG. 2.

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